UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA
SAN JOSE DIVISION

GILEAD SCIENCES, INC.,

PLAINTIFF, CASE NO. CV-13-4057-BLF

VS. SAN JOSE, CALIFORNIA

MERCK & CO., INC., ET AL., MARCH 9, 2016

DEFENDANTS. VOLUME 4

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TRANSCRIPT OF TRIAL PROCEEDINGS
BEFORE THE HONORABLE BETH LABSON FREEMAN
UNITED STATES DISTRICT JUDGE
A-P-P-E-A-R-A-N-C-E-S

FOR THE PLAINTIFF: FISH & RICHARDSON PC
BY: JUANITA R. BROOKS
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(APPEARANCES CONTINUED ON THE NEXT PAGE.)

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PROCEEDINGS RECORDED BY MECHANICAL STENOGRAPHY,
TRANSCRIPT PRODUCED WITH COMPUTER.

A P P E A R A N C E S: (CONT'D)

FOR THE DEFENDANTS: HUGHES, HUBBARD & REED
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FOR THE DEFENDANTS: MERCK
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IONIS
BY: CLIFF FORD
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CARLSBAD, CALIFORNIA 92010

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SAN JOSE, CALIFORNIA MARCH 9, 2016

P R O C E E D I N G S

(JURY OUT AT 10:00 A.M.)

THE COURT: GOOD MORNING EVERYONE. PLEASE BE SEATED.

MR. GENDERSON: GOOD MORNING, YOUR HONOR.

THE COURT: WE ARE OUTSIDE OF THE PRESENCE OF THE JURY. AND YESTERDAY THERE WERE SOME ISSUES AT THE END OF THE DAY, AND I'M SO SORRY I WAS UNABLE TO BE HERE EARLIER TODAY TO MEET WITH YOU TO RESOLVE THEM, BUT I WANTED TO TAKE A MOMENT BEFORE WE BROUGHT IN THE JURY TO MAKE SURE I UNDERSTAND WHERE WE ARE.

SO IT DOES APPEAR -- AND I THANK YOU FOR WORKING ON THE STIPULATIONS. AND AM I CORRECT THAT THERE IS A STIPULATION TO BE READ TO THE JURY STIPULATED FACTS 1 AND 2; IS THAT CORRECT?

MR. GENDERSON: THAT'S CORRECT, YOUR HONOR.

MS. BROOKS: YES, YOUR HONOR.

THE COURT: THANK YOU. AND WHEN WOULD YOU LIKE THIS READ?

MS. BROOKS: RIGHT BEFORE DR. SEEGER TESTIFIES, YOUR HONOR.

THE COURT: THAT'S FINE. THANK YOU.

MS. BROOKS: THANK YOU.

THE COURT: AND THEN I HAD TWO OTHER DOCUMENTS FILED, IT LOOKS LIKE THEY WERE FILED YESTERDAY, ONE FROM EACH

SIDE, AND THEY BOTH PERTAIN TO THE UNDISPUTED FACTS.

ARE THESE STILL AT ISSUE?

MR. RABINOWITZ: I DON'T BELIEVE THERE'S ANYTHING CURRENTLY LIVE FOR THE COURT TO ADDRESS.

THE COURT: THAT'S FINE. I APPRECIATE THAT.

AND IF WE COME UPON OTHER ISSUES, OBVIOUSLY WE DON'T ARGUE WHETHER SOMETHING IS STIPULATED. IT'S EITHER YOU AGREE IT'S, IN THE JOINT PRETRIAL ORDER, OR YOU CAN GO AHEAD AND PROVE THE FACT, BUT I'M GLAD TO HEAR ANY OF THOSE.

SO I DON'T BELIEVE WE HAVE ANY OTHER MATTERS TO DISCUSS THIS MORNING.

AND LET ME JUST ASK, MS. BROOKS, I UNDERSTAND YOU HAVE MORE VIDEO TO PLAY OF THE DEPOSITIONS?

MS. BROOKS: WE DO, YOUR HONOR.

THE COURT: AND HOW MUCH IS THAT GOING TO BE?

MS. BROOKS: I BELIEVE IT IS SLIGHTLY OVER AN HOUR. WE HAVE AN 8 MINUTE VIDEO THAT I TALKED ABOUT YESTERDAY; AND THEN A 36 MINUTE VIDEO; AND THEN A 20 MINUTE ONE; AND THEN A LIVE WITNESS.

THE COURT: THAT'S GREAT. OKAY. WE'LL JUST PROCEED. I WAS CURIOUS, ANY WAY YOU WISH TO PRESENT IT IS FINE WITH ME.

AND I THINK THAT TAKES CARE OF EVERYTHING.

AND I BELIEVE IT WAS -- MS. SALINAS-HARWELL DID INFORM YOU ABOUT THE VIDEOTAPED TESTIMONY. IN MY VIEW IT HAS THE SAME

CHARACTER AS THE ORAL TESTIMONY OF THE WITNESS BEING HERE IN COURT AND SO ALTHOUGH THE TRANSCRIPT MUST BE PART OF THE RECORD, THE TRANSCRIPT DOES NOT GO TO THE JURY. THEY'RE WELCOME TO HAVE A READBACK OF IT IF THEY WANT TO HEAR IT AGAIN JUST LIKE ANY OTHER TESTIMONY, BUT IT DOESN'T HAVE THE -- IT DOESN'T CHANGE IT IN CHARACTER AS OTHER ORAL TESTIMONY.

ALL RIGHT. ARE WE READY TO BRING IN THE JURY?

MS. BROOKS: WE ARE, YOUR HONOR.

THE COURT: LET'S DO THAT.

(JURY IN AT 10:02 A.M.)

THE COURT: GOOD MORNING. PLEASE BE SEATED EVERYONE. WE'RE BACK ON THE RECORD AND OUR JURORS ARE HERE. WE HAD A LITTLE BIT OF A LATE START DUE TO MY SCHEDULE SO I APPRECIATE THAT. SO WE'RE GOING TO GET RIGHT BACK DOWN TO WORK. AND WHEN WE LEFT OFF YESTERDAY, MS. BROOKS WAS PRESENTING DEPOSITION TESTIMONY, AND I BELIEVE WE'RE GOING TO RETURN TO THAT.

IS THAT CORRECT?

MS. BROOKS: YES. THANK YOU VERY MUCH, YOUR HONOR.

OUR NEXT DEPOSITION CLIP IS THAT OF KRYZSZTOF PANKIEWICZ. K-R-Y-Z-S-Z-T-O-F IS THE FIRST NAME; P-A-N-K-I-E-W-I-C-Z IS THE LAST NAME.

DR. PANKIEWICZ WAS A DIRECTOR OF CHEMISTRY AT PHARMASSET, AND HE WAS JEREMY CLARK'S SUPERVISOR AT THE TIME THAT MR. CLARK SYNTHESIZED PSI-6130.

(THE VIDEOTAPED DEPOSITION OF KRYZSZTOF PANKIEWICZ WAS PLAYED.)

MS. BROOKS: YOUR HONOR, THAT CONCLUDES THAT DEPOSITION.

THE NEXT DEPOSITION WE WILL BE PLAYING IS THAT OF QUANLAI SONG, AND THAT'S SPELLED Q-U-A-N-L-A-I, FIRST NAME; LAST NAME S-O-N-G, SONG.

AND DR. SONG WAS A CHEMIST AT ISIS WORKING ON NUCLEOSIDES DURING THE MERCK/ISIS COLLABORATION BUT IS NOT ONE OF THE LISTED INVENTORS ON THE '499 OR THE '712 PATENTS.

(THE VIDEOTAPED DEPOSITION OF QUANLAI SONG WAS PLAYED.)

MS. BROOKS: YOUR HONOR, THAT CONCLUDES THE DEPOSITION OF MR. SONG.

AND THE LAST DEPOSITION THAT WE HAVE BEFORE WE CALL OUR NEXT LIVE WITNESS IS THAT OF ABDULLAH HASSAN, A-B-D-U-L-L-A-H, H-A-S-S-A-N.

DR. HASSAN WAS A LEAD SCIENTIST AT PHARMASSET WORKING ON NUCLEOSIDE SYNTHESIS INCLUDING 2 METHYL UP NUCLEOSIDES FOR HCV.

(THE VIDEOTAPED DEPOSITION OF ABDULLAH HASSAN WAS PLAYED.)

MS. BROOKS: AND THAT CONCLUDES THE DEPOSITION OF DR. HASSAN, YOUR HONOR.

AND WE WOULD ASK TO MOVE SOME EXHIBITS INTO EVIDENCE THAT WERE DISCUSSED IN THE DEPOSITION.

FIRST THE DEPOSITION OF DR. PANKIEWICZ WOULD BE EXHIBIT 1083.

AND I BELIEVE THESE ARE ALL UNOBJECTED TO.

DR. SONG WOULD BE EXHIBITS 36, 37, 108, 109, AND 118.

AND DR. HASSAN WOULD BE EXHIBITS 1087, 1200, AND 2633.

MR. GENDERSON: NO OBJECTION, YOUR HONOR.

THE COURT: THANK YOU. THOSE WILL ALL BE ADMITTED.

(PLAINTIFF'S EXHIBITS 1083, 36, 37, 108, 109, 118, 1087, 1200, 2633 WERE RECEIVED IN EVIDENCE.)

(RECESS FROM 11:32 A.M. UNTIL 11:32 A.M.)

THE COURT: PLEASE BE SEATED. IT LOOKS AS THOUGH WE HAVE OUR COMPUTER BACK IN LINE.

ALL RIGHT. MS. BROOKS, ARE YOU READY TO CALL YOUR NEXT WITNESS?

MS. BROOKS: WE ARE, YOUR HONOR. OUR NEXT WITNESS IS DR. MICHAEL OTTO, AND MR. MCMAHON WILL BE DOING THE EXAMINATION.

THE COURT: THANK YOU. DR. OTTO, IF YOU WOULD COME FORWARD TO THE WITNESS STAND AND STAND TO BE SWORN.

(PLAINTIFF'S WITNESS, MICHAEL OTTO, WAS SWORN.)

THE WITNESS: YES.

THE CLERK: THANK YOU. PLEASE BE SEATED.

MR. MCMANN: MAY I APPROACH, YOUR HONOR?

THE COURT: YES, PLEASE.

THE CLERK: IF YOU WOULD PLEASE STATE YOUR NAME AND SPELL YOUR LAST NAME FOR THE RECORD.

THE WITNESS: MY NAME IS MICHAEL JOHN OTTO, O-T-T-O.

MR. MCMANN: MAY I PROCEED, YOUR HONOR?

THE COURT: YES, PLEASE.

DIRECT EXAMINATION

BY MR. MCMANN:

Q. GOOD MORNING, DR. OTTO.

A. GOOD MORNING.

Q. DR. OTTO, WHAT DO YOU DO FOR A LIVING?

A. I'M CURRENTLY RETIRED. I DO SOME CONSULTING, AND I SERVE ON THE BOARD OF DIRECTORS OF A SMALL BIOTECH COMPANY THAT IS INTERESTED IN ANTI-INFECTIVES.

Q. IT MIGHT HELP IF YOU LEAN INTO THE MICROPHONE OR BRING IT CLOSER.

A. IS THAT BETTER?

Q. THAT'S BETTER.

A. OKAY.

Q. COULD YOU TELL US A LITTLE BIT MORE ABOUT THE COMPANY WHERE YOU WORK TODAY, SIR?

A. IT'S A -- AS I SAID, IT IS A SMALL BIOTECH COMPANY. IT'S INTERESTED IN TREATMENTS FOR INFLUENZA VIRUS, AS WELL AS THE TREATMENT OF MERSA, WHICH IS METHICILLIN-RESISTANT STAPH AUREUS.

Q. FROM 1999 TO 2012, WERE YOU THE CHIEF SCIENTIFIC OFFICER AT PHARMASSET?

A. I WAS.

Q. WAS THAT THE TIMEFRAME WHEN PSI-6130 AND SOFOSBUVIR WERE

DISCOVERED?

A. YES, IT WAS.

Q. WE'RE GOING TO TALK TODAY ABOUT THAT DISCOVERY OF PSI-6130, BUT FIRST LET'S DO A LITTLE BIT ABOUT YOUR BACKGROUND AND EXPERIENCE.

I'VE BEEN CALLING YOU DR. OTTO. YOU HAVE A PH.D.?

A. I DO.

Q. AND IN WHAT FIELD?

A. IT'S IN THE MEDICAL MICROBIOLOGY.

Q. WHEN DID YOU GET YOUR DEGREE?

A. 1977.

Q. AND CAN YOU EXPLAIN TO THE JURY WHAT MEDICAL MICROBIOLOGY IS?

A. IT'S THE STUDY OF ORGANISMS, VIRUSES, BACTERIA AND FUNGUSES THAT CAUSES DISEASES IN HUMAN BEINGS.

Q. IN YOUR EDUCATION, DOCTOR, DID YOU RECEIVE TRAINING IN ANTI-VIRAL DRUG DISCOVERY?

A. YES.

Q. AND COULD YOU GO THROUGH YOUR EDUCATION AND EXPLAIN WHAT YOU DID THAT HELPED YOU PREPARE FOR A CAREER IN ANTI-VIRAL DRUG DISCOVERY?

A. WELL, I STARTED OUT ACTUALLY LOOKING AT INTERFERONS FOR THE TREATMENT OF VIRUSES. AND THEN I DID A POST-DOCTORAL, I LOOKED AT HOW VIRUSES INTERACTED WITH CELLS, BECAUSE IT'S IMPORTANT TO UNDERSTAND THAT INTERACTION.

THEN I WENT TO YALE SCHOOL OF MEDICINE WHERE I STARTED WORKING ON NUCLEOSIDES FOR THE TREATMENT OF HERPES VIRUSES.

Q. AND WHAT YEAR DID YOU FINISH AT YALE?

A. I THINK IT WAS 1982, I THINK.

Q. AND I THINK YOU TOLD US A MOMENT AGO YOU WENT TO PHARMASSET IN '99?

A. YES.

Q. SO IN THE YEARS BETWEEN FINISHING AT YALE AND GOING TO PHARMASSET, DID YOU WORK IN INDUSTRY?

A. I DID.

Q. WAS YOUR WORK RELATED TO ANTI-VIRAL DRUG DISCOVERY?

A. IT WAS ALMOST ENTIRELY ANTI-VIRAL DRUG DISCOVERY.

Q. AND CAN YOU WALK USE THROUGH YOUR CAREER PATH FROM WHEN YOU LEFT YALE UNTIL YOU WENT TO PHARMASSET, AGAIN, WITH THE RESEARCH ON WORKING AGAINST VIRUSES?

A. YEAH. I STARTED OUT WITH A COMPANY CALLED STERLING DRUG WHERE I WAS RESPONSIBLE FOR TRYING TO FIND A CURE FOR THE COMMON COLD.

Q. DID YOU FIND ONE?

A. NO.

(LAUGHTER.)

THE WITNESS: WE FOUND SOME INTERESTING TREATMENTS, BUT NO CURES.

I ALSO WORKED ON SOME HERPES VIRUS COMPOUNDS.

FROM THERE I WENT TO DUPONT PHARMACEUTICALS WHERE I WAS

CHARGED WITH SETTING UP AN ANTI-VIRAL DRUG DISCOVERY PROGRAM.

BY MR. MCMANN:

Q. AND YOU AND I SHARE THE SAME CHARACTERISTIC, DR. OTTO. WE SOMETIMES TEND TO SPEAK QUICKLY.

A. YES.

Q. AND IF YOU COULD SLOW DOWN WHILE YOU'RE TALKING.

A. I WILL DO THAT.

Q. I'M SORRY. YOU WERE TALKING ABOUT DUPONT.

A. SO I WAS AT DUPONT AND THERE I WAS PRIMARILY INVOLVED IN LOOKING FOR COMPOUNDS THAT WOULD TREAT HIV. I WAS THERE FOR SEVEN OR EIGHT OR NINE YEARS.

THEN I JOINED A SMALL STARTUP COMPANY, A BIOTECH SMALL STARTUP CALLED AVID THERAPEUTICS IN PHILADELPHIA WHERE WE WERE LOOKING FOR DRUGS THAT WOULD TREAT HEPATITIS B AND HEPATITIS C.

THAT COMPANY WAS PURCHASED AND I JOINED RHONE POULENC RORER WHERE PART OF MY JOB WAS TO BE THE LIAISON BETWEEN THE FRENCH ANTI-VIRAL DRUG DISCOVERY GROUPS AND U.S. CLINICAL GROUPS, AND THEN IT WAS AFTER THAT THAT I JOINED PHARMASSET.

Q. AND WHEN YOU JOINED PHARMASSET, WHERE WAS IT LOCATED?

A. IN TUCKER, GEORGIA.

Q. AND HOW DID YOU END UP GOING TO PHARMASSET?

A. WELL, I HAD KNOWN THE FOUNDERS AND ONE OF THE PRIMARY FOUNDERS, DR. SCHINAZI, WAS A COLLEAGUE THAT I HAD MET MANY TIMES AND HE RECRUITED ME TO COME TO WORK AT THE SMALL COMPANY.

AND I THOUGHT IT WAS AN AMAZING OPPORTUNITY BECAUSE HERE

WAS THIS VERY SMALL COMPANY NOT ENCUMBERED BY ANY KIND OF LARGE BUREAUCRACY AND CLEARLY FOCUSSED ON THE DISCOVERY OF ANTI-VIRAL DRUGS USING NUCLEOSIDES.

Q. AND WHEN YOU WERE HIRED, WHAT WAS YOUR TITLE?

A. CHIEF SCIENTIFIC OFFICER.

Q. AND THOSE WHO DO NOT WORK IN THE PHARMACEUTICAL COMPANY, CAN YOU EXPLAIN IN THE HIERARCHY WHAT THE CHIEF SCIENTIFIC OFFICER DOES?

A. HE OR SHE IS THE TOP SCIENTIST. ALL OF THE SCIENTISTS REPORT UP TO THAT PERSON AND IN TO THAT PERSON, AND THEN MY JOB WAS BASICALLY TO COORDINATE ALL OF THE RESEARCH THAT WAS BEING DONE AT PHARMASSET.

Q. NOW, WHEN YOU JOINED PHARMASSET IN 1999, ABOUT HOW MANY EMPLOYEES DID THE COMPANY HAVE?

A. IN 1999, I BELIEVE WE WERE LESS THAN 12.

Q. AND IF WE CAN --

MR. ANG, IF WE CAN HAVE PDX 401.

I THINK IT'S A PHOTOGRAPH OF THE EARLY PHARMASSET TEAM. DO YOU SEE THAT?

A. I DO.

Q. AND COULD YOU POINT YOURSELF OUT, DR. OTTO?

A. I'M IN THE SECOND ROW SECOND TO THE LEFT.

Q. IN THE WHITE SHIRT?

A. YES.

Q. AND DO YOU STILL LOOK THE SAME?

A. NO.
Q. AND DO YOU SEE ALAN ROEMER?
A. HE'S IN THE FIRST ROW FARTHEST TO THE RIGHT.
Q. NOW, IS THIS MOST OF THE PHARMASSET TEAM AT THAT TIME?
A. YEAH. I THINK THERE ARE A COUPLE OF PEOPLE MISSING, BUT THIS IS BASICALLY THE COMPANY.
Q. SO NOT QUITE THE SIZE OF DUPONT OR RHONE POULENC?
A. NO.
Q. AND COULD YOU EXPLAIN A LITTLE BIT MORE WHAT INTERESTED YOU TO GO TO A LITTLE COMPANY LIKE PHARMASSET AFTER WORKING FOR A COMPANY LIKE DUPONT OR PHONE POULENC?
A. WELL, IN MY EXPERIENCE MOST OF THE BIG BREAKTHROUGHS, AT LEASE IN MY FIELD, CAME FROM SMALL COMPANIES, SMALL GROUPS, NOT FROM LARGE PHARMA, AND IT'S NOT BECAUSE THEY DON'T HAVE REALLY GOOD SCIENTISTS, IT'S BECAUSE THEY'RE ENCUMBERED BY A LOT OF PROCESS AND A LOT OF BUREAUCRACY. THEY HAVE A LOT MORE RESOURCES, BUT THEY CAN'T FOLLOW THEIR CREATIVITY, AND IN A SMALL COMPANY YOU CAN DO THAT.
Q. AND WHEN YOU FIRST JOINED PHARMASSET, WHAT KIND OF RESEARCH WAS PHARMASSET FOCUSSED ON?
A. DISCOVERING NUCLEOSIDES THAT COULD TREAT HEPATITIS B, POTENTIALLY HEPATITIS C, AS WELL AS HIV.
Q. LET'S TURN TO PHARMASSET'S WORK IN THE 2000 AND 2001 TIMEFRAME. OKAY?
A. OKAY.

Q. AT THAT TIME DID PHARMASSET HAVE NUCLEOSIDES?
A. YES.
Q. AND WHERE WAS PHARMASSET GETTING NUCLEOSIDES?
A. WE HAD A SMALL SCIENTIFIC CHEMISTRY STAFF THAT WAS MAKING NUCLEOSIDES. WE HAD A LIBRARY OF AROUND 3,000 COMPOUNDS THAT ACTUALLY DR. KYO WATANABE BROUGHT WITH HIM.
Q. WHO WAS DR. WATANABE?
A. HE WAS THE HEAD OF CHEMISTRY, THE VICE PRESIDENT OF CHEMISTRY. HE WAS A MAN WITH A LOT OF EXPERIENCE IN NUCLEOSIDE CHEMISTRY. HE CAME FROM ROCKEFELLER, AND HE WORKED ON NUCLEOSIDES MOST OF HIS CAREER.
Q. AND YOU SAID HE HAD A LIBRARY?
A. YES, HE HAD A PHYSICAL LIBRARY OF ABOUT 3,000 COMPOUNDS.
Q. DO YOU MEAN COMPOUNDS DRAWN OUT IN A BOOK OR SOMETHING ELSE?
A. NO. IT WAS PHYSICAL COMPOUNDS, IN VIALS.
Q. AND HE BROUGHT THOSE TO THE COMPANY?
A. HE DID.
Q. AND WAS PHARMASSET ABLE TO TEST THE NUCLEOSIDES THAT IT HAD ACCESS TO?
A. YES.
Q. AND WHAT WAS THE PRIMARY ASSAY THAT YOU WOULD USE TO TEST THE NUCLEOSIDES?
A. IN THAT TIME PERIOD, FOR HEPATITIS C, THE PRIMARY ASSAY WAS ONE THAT WAS BASED ON A REPLICON CELL WHICH ALLOWS YOU TO

LOOK AT THE REPRODUCTION OF THE VIRUS GENOME.

Q. AND CAN YOU TAKE A STEP BACK AT A HIGH LEVEL AND EXPLAIN FOR THE JURY, WHAT IS AN ASSAY? WHAT DOES IT TELL YOU?

A. WELL, THE ASSAY THAT WE DESIGNED WAS ONE THAT WOULD ALLOW US TO MEASURE WHETHER OR NOT THE VIRUS WAS STAYING ALIVE, ACTUALLY REPRODUCING ITSELF; AND ALSO WOULD ALLOW US TO SEE WHETHER OR NOT THE TEST COMPOUNDS WERE TOXIC WOULD KILL THE CELLS. AND SO IT WAS A COMBINATION OF ASSAY.

Q. AN ASSAY GENERATES DATA?

A. ABSOLUTELY.

Q. AND WHY IS DATA IMPORTANT TO YOUR WORK?

A. WELL, DATA DRIVES ALL OF THE DISCOVERY. WITHOUT DATA, YOU KNOW, YOU CAN'T DETERMINE WHETHER OR NOT YOUR TEST COMPOUND IS POTENTIALLY GOING TO BE ACTIVE OR IS IT GOING TO BE TOXIC. SO YOU ACCUMULATE DATA TO DETERMINE THAT.

Q. NOW, A MOMENT AGO YOU MENTIONED THAT THE REPLICON ASSAY GIVES YOU DATA OR INFORMATION ABOUT ACTIVITY AND TOXICITY.

CAN YOU EXPLAIN FOR THE JURY FIRST, WHAT DO YOU MEAN BY ACTIVITY?

A. SO WHEN I SAY ACTIVITY IN THIS FIELD, IT MEANS THAT THE COMPOUND THAT YOU'RE TESTING ACTUALLY KILLS THE VIRUS, STOPS IT FROM BECOMING -- MAKING MORE COPIES OF ITSELF.

AND THEN THERE'S ALSO TOXICITY, WHICH IS ANOTHER ASPECT OF THAT.

Q. AND WHAT IS TOXICITY?

A. TOXICITY IS YOU OBVIOUSLY WANT A COMPOUND THAT WOULD KILL THE VIRUS, BUT NOT KILL THE CELL, MEANING KILLING THE PATIENT. YOU DON'T WANT THAT.

Q. AND IN YOUR WORK ON NUCLEOSIDES, DID YOU FIND TOXICITY TO BE OF A PARTICULAR CONCERN?

A. WELL, YES. WITH NUCLEOSIDES IT'S ALWAYS A CONCERN.

Q. AND WHY IS THAT?

A. WELL, NUCLEOSIDES, YOU KNOW, THEY'RE THE BUILDING BLOCKS OF ALL OF THE GENETIC MATERIAL IN YOUR CELL. THEY'RE RESPONSIBLE FOR MAKING NEW GENES AND THEY'RE ALL RESPONSIBLE FOR BUILDING RNA, WHICH IS IMPORTANT FOR GETTING ALL OF THE PROTEINS YOU NEED.

SO YOU DON'T WANT ANYTHING THAT WOULD JUST INTERFERE WITH YOUR DNA OR YOUR RNA.

Q. NOW, DR. OTTO, THROUGH THE END OF 2001, ABOUT HOW MANY NUCLEOSIDES HAD PHARMASSET TESTED?

A. IN 2001? THOUSANDS. I'M NOT SURE HOW MANY.

Q. AND DID ANY OF THESE NUCLEOSIDES INCLUDE COMPOUNDS WITH A METHYL UP AT THE 2' POSITION?

A. YES.

Q. DO YOU RECALL WHEN PHARMASSET FIRST BEGAN TESTING NUCLEOSIDES WITH A METHYL UP AT THE 2' POSITION?

A. IN 2001. AS EARLY AS 2000 FOR A COUPLE OF THE COMPOUNDS.

Q. AND WAS THERE A PARTICULAR SCIENTIST WHO WAS WORKING ON MAKING NUCLEOSIDES WITH A METHYL UP AT THE 2' POSITION?

A. YES, DR. HASSAN.
Q. AND DR. HASSAN WAS A NUCLEOSIDE CHEMIST?
A. HE WAS.
Q. ARE YOU FAMILIAR WITH A NUCLEOSIDE CALLED PSI-5557?
A. YES, I AM.
Q. AND YOU JUST TOLD US A MOMENT AGO THAT PHARMASSET WAS WORKING WITH HUNDREDS OF THOUSANDS OF COMPOUNDS. WHY IS IT THAT YOU REMEMBER THAT ONE IN PARTICULAR?
A. I REMEMBER IT BECAUSE IT WAS A FAIRLY ACTIVE COMPOUND IN THAT IT INHIBITED THE VIRUS.
UNFORTUNATELY, IT ALSO HAD SOME TOXICITY ISSUES THAT WOULD ALSO KILL THE CELLS AT CERTAIN CONCENTRATIONS.
Q. DID YOU USE IT IN ANY PARTICULAR WAY IN YOUR STUDIES?
A. WELL, ONCE WE HAD MADE IT AND TESTED IT AND DETERMINED WHAT ITS LEVEL OF ACTIVITY WAS, IT HAD A LEVEL OF ACTIVITY AND A VIRAL ACTIVITY IN OUR ASSAY THAT WE WANTED TO USE LIKE A BENCHMARK. SO WE DID THAT.
Q. IS THAT SOMETIMES CALLED A CONTROL?
A. WE DO CALL IT CONTROL, YES.
Q. NOW, DR. OTTO, YOU TOLD US THAT THAT COMPOUND WAS ACTIVE AND ALSO TOXIC?
A. YES.
Q. AND HOW DO YOU KNOW IT WAS ACTIVE AND ALSO TOXIC?
A. THROUGH THE USE OF THE ASSAY THAT WE WERE TALKING ABOUT A FEW MINUTES AGO.

Q. AT PHARMASSET DURING THIS TIMEFRAME, IN 2001, WHO WAS RESPONSIBLE FOR RUNNING ASSAYS?

A. WELL, THAT WAS LIEVEN STUYVER'S RESPONSIBILITY AND HIS GROUP.

Q. AND, DR. OTTO, IF YOU LOOK IN THE MATERIALS IN FRONT OF YOU, IF YOU CAN TURN TO THE DOCUMENT MARKED PDX-2002.

A. I'M HAVING TROUBLE FINDING IT. I'M SORRY.

Q. TAKE YOUR TIME.

PTX 1002. I'M SORRY. EX. IT'S EXHIBIT. OLD HABITS. I'M SORRY. EX 1002.

A. I HAVE IT.

Q. ARE YOU FAMILIAR WITH EXHIBIT 1002?

A. YES. IT'S A PHOTOCOPY OF IT LOOKS LIKE LIEVEN STUYVER'S, ONE OF HIS NOTEBOOKS.

Q. HOW IS IT THAT YOU'RE FAMILIAR WITH LIEVEN STUYVER'S NOTEBOOKS?

A. SINCE I WAS IN CHARGE OF ALL OF THE SCIENCE, PART OF MY JOB WAS TO SPEAK TO THE SCIENTISTS, REVIEW DATA, AND LIEVEN AND I WOULD OFTEN TALK ABOUT THE LATEST DATA. AND SO THAT WOULD BE OPENING UP THE NOTEBOOKS AND LOOKING THROUGH THE DATA THAT HE HAD.

Q. AND YOU WERE HIS BOSS?

A. YES.

Q. AND WHEN YOU SAID LOOKING THROUGH NOTEBOOKS, DO YOU ALSO MEAN THIS PARTICULAR NOTEBOOK?

A. YEAH, I HAVE LOOKED AT THIS NOTEBOOK.
Q. AT THE TIME IN 2001?
A. OH, YES.
MR. MCMANN: YOUR HONOR, AT THIS TIME WE WOULD OFFER PDX 1002 INTO EVIDENCE.
THE COURT:
MR. GENDERSON: NO OBJECTION.
THE COURT: IT'S ADMITTED.
(PLAINTIFF'S EXHIBIT 1002 WAS RECEIVED IN EVIDENCE.)
BY MR. MCMANN:
Q. IF YOU COULD TURN TO THE LAB NOTEBOOK PAGE 144 IN THE TOP LEFT, AND AT THE BOTTOM RIGHT OF THE EXHIBIT THE NUMBER IS 146.
A. OKAY. I HAVE THAT PAGE.
Q. AND CAN YOU TELL THE LADIES AND GENTLEMEN OF THE JURY -- I KNOW IT'S VERY SMALL AND HARD TO SEE -- WHAT INFORMATION IS REFLECTED ON PAGE 146 OF EXHIBIT 1002?
A. 136.
Q. YOU'RE LOOKING AT THE RIGHT PAGE?
A. I SEE.
Q. YEAH.
A. THIS IS BASICALLY RAW DATA. THIS IS THE NUMBERS THAT COME OUT OF THE MACHINE THAT IS USED TO MEASURE THE EFFECT IN THIS ASSAY.
AND SO FROM THIS YOU CAN CALCULATE WHETHER OR NOT A COMPOUND AT A GIVEN CONCENTRATION IS INHIBITING THE VIRUS

AND/OR IS TOXIC TO THE CELL.

Q. AND WHILE IT'S VERY TINY, IS PSI-5557 ONE OF THE COMPOUNDS BEING TESTED?

A. YES, IT IS.

Q. NOW, IF YOU TURN TO THE PAGE THAT IS PAGE 148 OF THE EXHIBIT, OF EXHIBIT 1002?

A. YES.

Q. IS SOME OF THE RESULTS FOR PSI-5557 SUMMARIZED IN THE ITEM NUMBER 4 AT THE BOTTOM OF THE EXHIBIT?

A. YES, IT'S THE SUMMARY OF THE RESULTS FROM PSI-5557.

Q. AND CAN YOU TELL THE JURY, WHAT IS THE DATE THAT THIS DATA WAS RECORDED?

A. THIS WAS MAY 1ST, 2001.

Q. NOW, DR. OTTO, THIS COMPOUND PSI-5557 THAT YOU WERE USING AS A CONTROL, DID THERE COME A POINT IN TIME AT PHARMASSET WHEN YOU BEGAN REFERRING TO IT AS THE MERCK COMPOUND?

A. YES, THERE WAS.

Q. AND CAN YOU EXPLAIN WHY THAT WAS?

A. AFTER WE MADE IT AND HAD BEEN USING IT FOR QUITE SOME TIME IN OUR ASSAYS, WE SAW THE PUBLICATIONS FROM MERCK WHERE THEY HAD EXAMPLES OF COMPOUNDS, PURINES LIKE THIS THAT HAD 2' METHYL 2' OH IN THE SUGAR. AND SO JUST FOR THE EASE OF SAYING THE NUMBER ALL OF THE TIME, WE JUST REFERRED TO IT AS THE MERCK COMPOUND.

Q. AND SO TO BE CLEAR, DID PHARMASSET GET THE IDEA OF

PSI-5557 FROM MERCK?

A. NO, THERE'S NO WAY THAT WE COULD HAVE BECAUSE WE MADE IT LONG BEFORE WE HAD SEEN ANYTHING FROM MERCK.

Q. WHY DIDN'T PHARMASSET PURSUE PSI-5557 AS A DEVELOPMENT COMPOUND?

A. WELL, PART OF THAT IS PERSONAL PREFERENCE. I HAVE A PREJUDICE AGAINST PURINES.

Q. AND WHEN YOU SAY A PURINE, WHAT DO YOU MEAN?

A. THAT'S A DOUBLE RING KIND OF NUCLEOSIDE THAT THIS IS.

AND THE REASON FOR THAT IS THAT THEY ARE OFTEN ASSOCIATED WITH EITHER OVERT TOXICITY OR VERY SUBTLE TOXICITIES AND THEY MAKE ME UNCOMFORTABLE.

AND WHEN WE SAW IN OUR ASSAY THAT IT HAD A SIGNIFICANT LEVEL OF TOXICITY TO THE CELLS THAT WE WERE USING IN THE ASSAY, IT MADE ME UNCOMFORTABLE.

SO WE REALLY WEREN'T THAT INTERESTED IN IT PER SE AND WE WERE LOOKING AT ALL KINDS OF COMPOUNDS AT THE TIME.

Q. NOW, IN ADDITION TO MODIFICATIONS OF METHYL UP 2', DID YOU AND YOUR COLLEAGUES AT PHARMASSET LOOK AT OTHER MODIFICATIONS OF THE 2' POSITION ON THE SUGAR RING OF A NUCLEOSIDE?

A. YES, WE DID. WE LOOKED AT A NUMBER OF MODIFICATIONS.

Q. AND WAS ONE OF THOSE FLUORINE MODIFICATIONS?

A. YES.

Q. AND CAN YOU TELL THE JURY WHERE YOU AND YOUR COLLEAGUES WERE PLACING FLUORINES ON NUCLEOSIDES IN 2001?

A. WE PLACED THEM IN MANY POSITIONS. 2' WAS ONE OF THOSE POSITIONS. WE ALSO DID 3'. WE ALSO PUT FLUORINES ON THE BASES. WE WERE EXPLORING FLUORINES FOR A LOT OF POSITIONS.

Q. I WANT TO TURN TO 6130 ITSELF. FIRST, WHAT IS THE STRUCTURE OF 6130?

A. 6130 IS A PYRIMIDINE NUCLEOSIDE. WHAT THAT MEANS IS THAT IT HAS A SMALL RING ON THE BASE, THAT'S THE CYTIDINE, AND IT HAS A RIBO SUGAR, AND IN THIS CASE OF 6130 -- AND THE SUGAR HAS A METHYL AND A FLUORINE AT THE 2' POSITION.

Q. WHO FIRST TOLD YOU ABOUT 6130?

A. JEREMY CLARK.

Q. AT PHARMASSET AFTER IT WAS MADE, DID YOU HAVE ANOTHER NAME FOR 6130?

A. IT WAS REFERRED TO AS JERM C, OR JEREMY'S COMPOUND.

Q. AND LET'S TALK FOR A MOMENT ABOUT MR. CLARK. WHEN WAS MR. CLARK HIRED?

A. IN 2000. I BELIEVE IT WAS LATE 2000.

Q. AND WHY WAS HE HIRED?

A. HE WAS HIRED BECAUSE WE REQUIRED -- WE WERE EXPANDING OUR GROUP, BUT WE NEEDED A SYNTHETIC -- AN ORGANIC CHEMIST WHO COULD WORK ON AN ANTI-CANCER PROGRAM.

Q. AND WHAT QUALITIES DID MR. CLARK HAVE THAT MADE HIM ATTRACTIVE TO YOU AND YOUR COLLEAGUES TO HIRE?

A. WELL, HE APPEARED TO BE VERY SMART, WELL READ. HE READ THE LITERATURE ALL OF THE TIME. HE WAS AMBITIOUS IN THAT HE

REALLY WANTED TO MAKE NEW DISCOVERIES, AND HE WAS HARD WORKING.

AND HE HAD THE SKILLS THAT WE NEEDED FOR THE JOB THAT WE WERE HIRING HIM FOR.

Q. AND DO YOU RECALL WHEN MR. CLARK FIRST TOLD YOU ABOUT HIS IDEA FOR PSI-6130?

A. I DO.

Q. AND DO YOU RECALL WHERE YOU WERE WHEN HE TOLD YOU?

A. I WAS IN MY OFFICE.

Q. AND DO YOU RECALL WHEN?

A. IN NOVEMBER OF 2002.

Q. AND CAN YOU DESCRIBE TO THE JURY YOUR MEETING WITH MR. CLARK IN NOVEMBER OF 2002?

A. HE CAME TO MY OFFICE WITH HIS IDEA FOR MAKING COMPOUNDS LIKE 6130, IN OTHER WORDS, COMPOUNDS THAT HAD A SUGAR THAT HAD METHYL AND FLUORINE AT THE 2' POSITION AND DIFFERENT BASES.

Q. AND WHICH DIFFERENT BASES?

A. WELL, HE HAD ALL FOUR OF THE NATURAL BASES. FOR RNA, THAT'S CYTISINE, URIDINE, ADENINE, AND GUANINE.

Q. AND WERE THOSE COMPOUNDS THE ONLY COMPOUNDS THAT HE SHOWED YOU?

A. NO. HE SHOWED ME SOME OTHER COMPOUNDS, BUT I UNFORTUNATELY DON'T REMEMBER WHAT THEY WERE.

Q. AND DID YOU ASK MR. CLARK IF HE THOUGHT HE COULD MAKE THESE COMPOUNDS?

A. I SURE DID.

Q. AND WHAT DID HE TELL YOU?
A. HE SAID YES, OF COURSE.
Q. AND AT THIS MEETING DID YOU ALSO DISCUSS PATENT APPLICATIONS?
A. WE DID.
Q. AND HOW IS IT THAT YOU CAME TO DISCUSS PATENT APPLICATIONS?
A. WELL, I HAD A MEETING WITH THE CHEMISTS AND AT THAT MEETING I ASKED THEM ALL TO REVIEW THE LITERATURE AND FIND AREAS THAT WE COULD WORK IN AT PHARMASSET THAT OTHER PEOPLE WEREN'T WORKING IN, AND AS PART OF THAT -- AFTER THAT JEREMY CAME TO MY OFFICE WITH HIS IDEAS THAT HE FELT THAT WERE SOMETHING NOVEL THAT HE COULD WORK ON.
Q. NOW, DR. OTTO, WITH RESPECT TO THIS INSTRUCTION TO LOOK IN THE LITERATURE, DID YOU SOMETIMES REFER TO THAT AS LOOKING FOR A LOOPHOLE OR CASHING IN ON A LOOPHOLE?
A. SURE.
Q. AND WHAT DID YOU MEAN BY THAT?
A. WELL, THE WHOLE IDEA WAS TO FIND AREAS WHERE OTHER PEOPLE WERE NOT WORKING.
Q. AND WHY DOES THAT MATTER?
A. WELL, PHARMASSET, AS YOU SAW, IS A VERY SMALL COMPANY AND THERE WAS NO WAY THAT WE COULD DIRECTLY COMPETE WITH LARGE PHARMACEUTICAL COMPANIES THAT HAD MUCH MORE RESOURCES.
AND SO THE IDEA WAS TO FIND AREAS THAT THEY WEREN'T

WORKING IN, WEREN'T MAKING COMPOUNDS IN, THAT WE COULD IF WE HAVE AN IDEA.

SO THE IDEA WAS TO HAVE THE CHEMIST COME UP WITH AN IDEA AND THEN LOOK TO SEE WHETHER OR NOT THEIR IDEA WAS SOMETHING ELSE -- WAS SOMETHING THAT OTHER PEOPLE WERE WORKING ON.

Q. DO YOU RECALL WHAT PATENT APPLICATIONS THAT MR. CLARK HAD THAT DAY?

A. HE BROUGHT A PATENT APPLICATION FROM MERCK AND A PATENT APPLICATION FROM A COMPANY CALLED IDENIX OR IDENIX.

Q. AND THE JURY HAS HEARD ABOUT MERCK BY NOW, BUT WHO WAS IDENIX?

A. IDENIX WAS ANOTHER COMPANY THAT WAS FOCUSSED ON NUCLEOSIDES FOR THE TREATMENT OF HEPATITIS C.

Q. AND DO YOU RECALL WHETHER YOU LOOKED AT THESE PATENT APPLICATIONS WITH MR. CLARK?

A. I DID LOOK AT THEM BRIEFLY, YES.

Q. AND WHAT CAN YOU TELL US ABOUT YOUR REVIEW?

A. THAT I AGREED WITH HIM THAT HIS IDEA WAS NOT IN EITHER ONE OF THOSE PATENTS.

Q. AND WHEN YOU SAY NOT IN EITHER ONE OF THOSE PATENTS, WHAT DO YOU MEAN BY THAT?

A. WELL, I SAW NO EVIDENCE THAT THEY WERE WORKING IN THIS -- IN THAT AREA, THAT THEY HAD MADE ANY OF THESE COMPOUNDS OR TESTED ANY OF THE COMPOUNDS. SO THERE WAS NO DATA. THERE WERE NO EXAMPLES.

Q. AND EXAMPLES LIKE 6130?
A. RIGHT.
Q. OKAY. DID YOU GIVE JEREMY A GREEN LIGHT?
A. I DID.
Q. AND WHY DID YOU TELL HIM TO GO AHEAD AND MAKE IT?
A. WELL, IT HADN'T BEEN MADE BEFORE, AND THE ONLY WAY YOU KNOW IF IT'S GOING TO WORK IS TO MAKE IT AND TEST IT.
Q. NOW, DID MR. CLARK, IN FACT, MAKE 6130?
A. HE DID.
Q. AND WHEN DID YOU LEARN THAT HE HAD MADE IT?
A. IN MAY OF 2003.
Q. AND WHAT DO YOU RECALL ABOUT LEARNING THAT MR. CLARK HAD MADE THE COMPOUND?
A. WELL, I THINK THE -- MY BEST RECOLLECTION IS WHEN HE PRESENTED TO THE COMBINED CHEMISTRY AND BIOLOGY GROUP.
Q. OKAY. AND IF YOU LOOK IN YOUR EXHIBIT AT PTX-520 -- I'M SORRY, I SAID IT AGAIN. EXHIBIT 520.
A. OKAY, I HAVE IT.
Q. DO YOU RECOGNIZE EXHIBIT 520?
A. I DO.
Q. AND WHAT IS IT?
A. THAT IS A COPY OF AN OVERHEAD TRANSPARENCY THAT JEREMY PRESENTED.
Q. AND WHEN YOU SAY OVERHEAD TRANSPARENCY, YOU'RE NOT TALKING ABOUT THE POWERPOINTS THAT WE SEE TODAY?

A. NO.
Q. AND WHAT WAS AN OVERHEAD TRANSPARENCY?
A. SO THE PRESENTER WOULD PRINT OUT ON A PIECE OF PAPER, WHATEVER THEY WANTED TO PRINT, AND THEN THEY WOULD MAKE A PHOTOCOPY ONTO THE ACETATE AND THE ACETATE WOULD BE PUT ON THE OVERHEAD PROJECTOR AND THEN YOU CAN SEE IT AND WE CAN PRESENT IT, AND SO IT'S A TRANSPARENCY.
Q. AND IS EXHIBIT 520 THE -- THE TRANSPARENCY THAT IS 520, IS THAT THE TRANSPARENCY THAT MR. CLARK USED IN MAY OF 2003?
A. YES.
MR. MCMANN: YOUR HONOR, AT THIS TIME WE WOULD OFFER EXHIBIT 520 INTO EVIDENCE.
MR. GENDERSON: NO OBJECTION, YOUR HONOR.
THE COURT: IT WILL BE ADMITTED.
(PLAINTIFF'S EXHIBIT 520 WAS RECEIVED IN EVIDENCE.)
BY MR. MCMANN:
Q. IF YOU LOOK AT THE SECOND PAGE OF EXHIBIT 520 FIRST.
A. YES.
Q. AND CAN YOU DESCRIBE THE MEETING USING THE FIRST TWO PAGES OF EXHIBIT 520 FOR THE JURY.
A. SO THE FIRST PART OF THE PRESENTATION WAS THAT JEREMY PRESENTED THE SCHEMATIC -- THIS IS THE SCHEMATIC OF A METHOD THAT HE USED TO SYNTHESIZE PSI-6130 OR JERM C, AND HERE HE'S DEMONSTRATING THAT THIS IS HOW HE DID IT.
Q. AND PSI-6130, THAT'S THE COMPOUND AT THE BOTTOM HERE

LABELLED JERM C?

A. YES.

Q. OKAY. NOW, THE SECOND SLIDE, WHAT HAPPENED WITH THE SECOND SLIDE, THE FIRST PAGE OF EXHIBIT 520?

A. THE SECOND SLIDE, AS YOU CAN SEE, IS ESSENTIALLY THE SAME THING WITH AN ADDED STATEMENT WHICH SAYS "THAT WHICH SOME CALL IMPOSSIBLE IS SIMPLY WHAT THEY'VE NOT SEEN."

Q. MR. CLARK PUT THAT ON THIS SLIDE?

A. YES.

Q. AND WHAT DID YOU THINK WHEN YOU SAW THAT?

A. I TOLD YOU SO.

Q. AND WHY DO YOU THINK MR. CLARK WAS SAYING I TOLD YOU SO?

A. BECAUSE WHEN HE FIRST PRESENTED HIS IDEA TO THE CHEMISTS, NO ONE BELIEVED THAT HE COULD DO IT. THEY THOUGHT THE CHEMISTRY WAS TOO DIFFICULT AND THAT HE WOULDN'T BE ABLE TO DO IT.

Q. HE WAS PROUD?

A. HE WAS VERY PROUD OF THE FACT THAT HE ACCOMPLISHED IT, YES.

MR. MCMANN: YOUR HONOR, IT IS ABOUT 12:00. I'M NOT SURE IF YOU WERE PLANNING TO TAKE YOUR LUNCH BREAK AT THIS TIME.

THE COURT: WELL, WE HAD A LATER START THIS MORNING, AND SO IF YOU WANT TO GO ON FOR ANOTHER 15 MINUTES, THAT'S FINE. BUT IF YOU WANT TO TAKE YOUR LUNCH BREAK NOW, IT'S YOUR

CHOICE.

MR. MCMANN: I'LL CONTINUE ANOTHER 15 MINUTES, YOUR HONOR.

THE COURT: OKAY. LET'S DO THAT.

BY MR. MCMANN:

Q. DR. OTTO, ON THE NEXT PAGE OF EXHIBIT 520, THERE'S SOME DATA PRESENTED.

A. YES.

Q. AND WHO PRESENTED THAT DATA?

A. THAT WAS DR. LIEVEN STUYVER.

Q. AND CAN YOU EXPLAIN TO THE JURY -- WELL, LET'S FOCUS ON THE FIRST GRAPH. CAN YOU EXPLAIN TO THE JURY WHAT IS PRESENTED AT THE TOP OF PAGE 3 OF EXHIBIT 520?

A. SO THIS IS A GRAPHICAL PRESENTATION OF A POWER -- WHAT CONCENTRATION OR DOSE, IF YOU WILL, THE COMPOUND INHIBITS OR KILLS THE VIRUS.

SO AS YOU -- AS THE LINES GO UP, THAT'S BETTER. SO IT MEANS YOU'RE KILLING MORE AND MORE OF THE VIRUS.

SO THE HIGHER THE LINE, AND THE SOONER IT GOES UP, THE BETTER.

Q. NOW, IS 6130 THE ONLY COMPOUND TESTED FOR ACTIVITY?

A. NO.

Q. AND WHAT ARE THE OTHERS?

A. WELL, THE -- IF YOU LOOK AT THE SQUARES, THE SQUARES ARE, AS WE ARE DISCUSSING, PSI-5557.

Q. AND WHAT IS THE STRUCTURE OF THAT ONE?
A. THAT IS METHYL AND OH AT THE 2' POSITION.
Q. AND WHAT KIND OF BASE?
A. AND IT'S AN ADENINE BASE.
Q. AND WHAT ARE THE OTHER COMPOUNDS WITH 6130?
A. PSI-5817 IS A CYTIDINE BASE, SO A SINGLE RING, AND THE SAME SUGAR AS 5557, MEANING THAT OH AND METHYL ARE THE 2' POSITION.
Q. AND THE OTHER COMPOUND, 262?
A. 262 IS A COMPOUND THAT HAD A SINGLE FLUORINE AT THE 2' POSITION AND AN H, AN H AND A FLUORINE.
Q. SO FAIR TO SAY THREE OF THE FOUR HAVE SINGLE RING AND ONLY ONE HAS THE METHYL FLUORO?
A. THAT'S CORRECT.
Q. AND HOW DID 6130 DO IN THIS ACTIVITY TEST?
A. 6130 SHOWED SIGNIFICANT ACTIVITY BETWEEN THE TWO OTHER COMPOUNDS, SO NOT QUITE AS POTENT, IF YOU WILL. IT TOOK MORE DRUG TO DO THE SAME EFFECT WITH IT THAN WITH THE ADENINE COMPOUND.

BUT IT WAS MORE POTENT THAN THE CORRESPONDING CYTIDINE COMPOUND WITH METHYL AND OH.

Q. NOW, THE BOTTOM GRAPH, WHAT DOES THAT DEPICT?
A. WELL, THAT'S -- THEY WOULD BE THE SAME ASSAY, BUT IN THIS CASE WE'RE LOOKING AT THE SAME CONCENTRATIONS THAT WE LOOKED AT FOR ACTIVITY, WE'RE LOOKING AS TO WHETHER OR NOT THEY KILL THE

CELLS.

AND IN THIS CASE WHAT YOU DON'T WANT TO SEE IS THAT YOU DON'T WANT TO SEE THE LINE GOING UP. IF THE LINE IS GOING UP, THAT MEANS IT'S KILLING CELLS.

SO IN THIS CASE IF YOU LOOK AT 5557, WHICH IS THE SQUARES AGAIN, YOU CAN SEE THAT IT'S KILLING THE CELLS SIGNIFICANTLY. AND AS YOU INCREASE THE CONCENTRATIONS, IT'S MORE AND MORE TOXIC.

IF YOU LOOK AT THE OTHER ONES, THEY'RE ESSENTIALLY FLAT. THEY'RE NOT REALLY GOING UP MUCH AT ALL. SO THEY'RE NOT DEMONSTRATING ANY SIGNIFICANT TOXICITY IN THIS ASSAY.

Q. SO, JUST, AGAIN, TO SUMMARIZE THAT, OF THE COMPOUNDS TESTED FOR TOXICITY, IN TERMS OF THE BASE, WHICH ONE IS SHOWING TOXICITY?

A. THE ADENINE BASE.

Q. THAT'S A DOUBLE RING?

A. THAT'S A DOUBLE RING.

Q. NOW, AT THIS SAME MEETING, MAY 23RD, 2003, DID YOU FURTHER DISCUSS THE MERCK PATENT APPLICATION?

A. YEAH, WE DID.

Q. IF YOU TURN IN YOUR MATERIALS NOW TO EXHIBIT 1721. IT SHOULD BE AT THE VERY BACK.

A. OKAY. I'VE GOT IT.

Q. AND WHAT IS EXHIBIT 1721?

A. THESE ARE MEETING MINUTES THAT REPRESENT WHAT OCCURRED AT

THE CHEMISTRY MEETING WHERE JEREMY PRESENTED AND LIEVEN PRESENTED.

MR. MCMANN: YOUR HONOR, AT THIS TIME WE WOULD OFFER EXHIBIT 1721 INTO EVIDENCE.

MR. GENDERSON: NO OBJECTION, YOUR HONOR.

THE COURT: IT WILL BE ADMITTED.

(PLAINTIFF'S EXHIBIT 1721 WAS RECEIVED IN EVIDENCE.)

BY MR. MCMANN:

Q. NOW, JUST TO BRIEFLY -- IF WE LOOK AT THE TOP, THERE IS SOME BULLETS UNDER THE NAME JEREMY CLARK.

A. YES.

Q. IS THAT WHERE MR. CLARK PRESENTED HIS OVERHEADS?

A. YES.

Q. AND THEN THERE'S SOME -- THERE'S DR. STUYVER'S NAME AND SOME BULLETS UNDER THAT. IS THAT WHERE THE DATA WAS PRESENTED?

A. YES.

Q. I'D LIKE TO FOCUS JUST A LITTLE FURTHER DOWN ON THE BULLET IT SAYS MJO.

IF WE CAN ENLARGE THAT, MR. ANG. THANK YOU.

SO ON EXHIBIT 1721 NEXT TO WHERE IT SAYS MJO, IT SAYS, "SUGGESTED MAKING THE BROMO ANALOG OF PSI-6130 TO PROVE MERCK'S CLAIM OF 'HALOGEN' AT THE 2' POSITION IS INVALID AND THEN PSI CAN HAVE CLAIMS ON THE PSI-6130 COMPOUND."

DO YOU SEE THAT?

A. I DO.

Q. DR. OTTO, WHAT PROBLEM WERE YOU HAVING WITH THE MERCK PATENT APPLICATION THAT YOU'RE DESCRIBING HERE?

A. MY BIGGEST PROBLEM WAS THAT THERE WAS NO EVIDENCE THAT THEY HAD ACTUALLY DONE ANY WORK.

Q. WHAT KIND OF EVIDENCE ARE YOU TALKING ABOUT?

A. WELL, THERE'S NO DATA. THERE'S NO EXAMPLES.

AND IF YOU'RE -- IF YOU'RE -- IF YOU WANT TO PATENT SOMETHING AND INVENT SOMETHING, ONE WOULD THINK THAT YOU WOULD HAVE YOUR INVENTION IN THERE ALONG WITH DATA TO SUPPORT IT. AND THAT'S WHAT, AS A SCIENTIST, I LOOK FOR IN PATENTS.

Q. DID YOU THINK THAT THE MERCK PATENT WAS INVALID, THE MERCK PATENT APPLICATION?

A. IN MY OPINION, YEAH. I DIDN'T BELIEVE THEY HAD THE DATA AND IT WAS NOT VALID.

Q. AFTER LOOKING AT DR. STUYVER'S DATA, WHAT DID YOU DO NEXT?

A. WE FILED A PROVISIONAL PATENT APPLICATION.

Q. AND IF YOU LOOK IN YOUR MATERIALS TO PTX-1209 -- I'M SORRY. I DON'T KNOW WHY I KEEP SAYING THAT. EXHIBIT 1209.

A. I SEE IT.

Q. AND IS THAT THE PATENT APPLICATION?

A. YES, IT IS.

Q. IS THIS APPLICATION DIRECTED TO PSI-6130?

A. YES, IT IS.

Q. AND WHAT IS THE DATE?

A. MAY 16TH --

Q. IF YOU LOOK AT THE FILING DATE.
A. WELL, THE FILING DATE IS MAY 30TH, 2003.
Q. AND HOW LONG IS THAT AFTER YOUR MEETING WHERE JEREMY PRESENTED HIS RESULTS?
A. SEVEN DAYS, A WEEK.
Q. AND DID YOU PARTICIPATE IN DRAFTING THIS DOCUMENT?
A. YES, I HELPED HIM.
MR. MCMANN: YOUR HONOR, AT THIS TIME WE WOULD OFFER PTX 12 -- EXHIBIT 1209 INTO EVIDENCE.
MR. GENDERSON: NO OBJECTION, YOUR HONOR.
THE COURT: IT WILL BE ADMITTED.
(PLAINTIFF'S EXHIBIT 1209 WAS RECEIVED IN EVIDENCE.)
BY MR. MCMANN:
Q. JUST BRIEFLY, DR. OTTO, CAN YOU TURN TO PAGE 37 OF THE EXHIBIT.
A. THAT'S 0037?
Q. YES.
A. YES.
Q. AND I KNOW YOU'RE NOT A CHEMIST, SIR, BUT CAN YOU JUST DESCRIBE WHAT IS BEING DEPICTED IN THE STRUCTURES ON THE BOTTOM OF PAGE 37 OF EXHIBIT 1209?
A. THIS IS A SYNTHESIS OF WHAT TURNED OUT TO BE 6130.
Q. SO THE SYNTHESIS THAT WAS ACTUALLY PERFORMED BY THE PHARMASSET CHEMIST, JEREMY CLARK?
A. YES.

Q. OKAY. AND IF YOU TURN TO PAGE 43.
A. YES.
Q. WHAT IS DEPICTED ON PAGE 43 OF EXHIBIT 1209?
A. THIS IS A GRAPH THAT SHOWS THE ACTIVITY, THE ANTI-VIRAL ACTIVITY, AS WELL AS ANY EVIDENCE OF TOXICITY FOR CELLS OF 6130.
Q. AND THIS GRAPH IN THE PATENT APPLICATION AT EXHIBIT 1209 AT PAGE 43, THIS IS WORK THAT SCIENTISTS AT PHARMASSET HAD PERFORMED PRIOR TO THE FILING OF THE APPLICATION?
A. YES.
Q. NOW, DID THIS APPLICATION ULTIMATELY BECOME AN ISSUED PATENT?
A. YES.
Q. AND IF YOU CAN TURN IN YOUR MATERIALS TO EXHIBIT 1101.
IS THAT THE PATENT THAT ISSUED FROM THE APPLICATION THAT WE JUST LOOKED AT?
A. YES, IT IS.
MR. MCMANN: YOUR HONOR, AT THIS TIME WE WOULD OFFER EXHIBIT 1101 INTO EVIDENCE.
MR. GENDERSON: NO OBJECTION, YOUR HONOR.
THE COURT: IT WILL BE ADMITTED.
(PLAINTIFF'S EXHIBIT 1101 WAS RECEIVED IN EVIDENCE.)
MR. MCMANN: YOUR HONOR, I'M ACTUALLY ABOUT TO CHANGE SUBJECTS, SO MAYBE THIS WOULD BE A GOOD TIME.
THE COURT: THIS WOULD BE A GOOD TIME THEN. THANK

YOU.

WE ARE GOING TO TAKE OUR NORMAL LUNCH BREAK. LET'S COME BACK AT TEN MINUTES PAST 1:00.

AND, DR. OTTO, I WOULD ASK YOU TO COME BACK AT THAT TIME AS WELL.

THE WITNESS: THANK YOU.

THE COURT: ALL RIGHT. HAVE A GOOD LUNCH.

THE CLERK: COURT IS IN RECESS.

(LUNCH RECESS TAKEN AT 12:08 P.M.)

AFTERNOON SESSION

(JURY IN AT 1:12 P.M.)

THE COURT: GOOD AFTERNOON EVERYONE. PLEASE BE SEATED.

ALL OF OUR JURORS ARE PRESENT. DR. OTTO HAS RETURNED TO THE WITNESS STAND.

GO AHEAD, MR. MCMANN.

MR. MCMANN: THANK YOU, YOUR HONOR.

Q. DR. OTTO, JUST TO REORIENT US AFTER LUNCH.

I WANT TO TAKE YOU BACK TO YOUR OFFICE IN NOVEMBER 2002 WHEN YOU TOLD US THAT MR. CLARK HAD COME IN WITH A PIECE OF PAPER.

DO YOU RECALL GIVING THAT TESTIMONY?

A. YES.

Q. AND HE HAD DRAWN THE SUGAR RING WITH THE METHYL UP AND THE FLUORO DOWN, AND HE INDICATED HE WANTED TO MAKE THAT WITH EACH OF THE FOUR NATURAL BASES?

A. YES.

Q. AND 6130, IS THAT SUGAR RING WITH THAT CYTOSINE SINGLE RING BASE?

A. YES.

Q. AND DID PHARMASSET EVER MAKE JEREMY'S SUGAR RING, THE METHYL UP FLUORO DOWN, WITH THE DOUBLE RING ADENINE BASE?

A. YES.

Q. DOCTOR, IF YOU COULD LOOK IN YOUR MATERIALS AT

EXHIBIT 159.

A. YES.

Q. ARE YOU FAMILIAR WITH EXHIBIT 159?

A. I AM.

Q. WHAT IS IT?

A. IT'S A PAPER THAT THE GROUP AT PHARMASSET PUBLISHED ON TESTING OF COMPOUNDS, PURINES WITH LOOKING AT THE EFFECT OF PUTTING METHYL AND FLUORINE AT THE 2' POSITION.

Q. YOU'RE AN AUTHOR OF THIS PAPER?

A. I AM.

MR. MCMANN: YOUR HONOR, AT THIS TIME WE WOULD MOVE EXHIBIT 159 INTO EVIDENCE.

MR. GENDERSON: NO OBJECTION.

THE COURT: IT WILL BE ADMITTED.

(PLAINTIFF'S EXHIBIT 159 WAS RECEIVED IN EVIDENCE.)

BY MR. MCMANN:

Q. NOW, FIRST, DR. OTTO, I NOTICE AFTER JEREMY CLARK'S NAME THERE'S A COUPLE OF SYMBOLS INDICATING LOOK AT THE FOOTNOTES AND IT HAS ADDRESSES SRI.

DO YOU SEE THAT?

A. I DO.

Q. AND HAD JEREMY LEFT PHARMASSET AT THIS TIME?

A. AT THE TIME OF PUBLICATION, YES.

Q. OKAY. NOW, IN THIS PAPER IF YOU COULD FOCUS ON THE FIRST PAGE, THE SECOND FULL PARAGRAPH. DO YOU HAVE THAT IN FRONT OF

YOU?

A. YES.

Q. AND I'D LIKE TO SORT OF TAKE THIS SENTENCE BY SENTENCE.

THE FIRST SENTENCE SAYS, "SEVERAL 2' C METHYL PURINE NUCLEOSIDE ANALOGS WITH POTENT INHIBITORY ACTIVITY AGAINST THE HCV NS5B POLYMERASE HAVE BEEN IDENTIFIED?"

DO YOU SEE THAT?

A. I DO.

Q. AND THEN THERE'S FOOTNOTE CITATION 2 TO 5?

A. YES.

Q. AND COULD YOU TRANSLATE FOR US IN ENGLISH, WHAT IS THAT FIRST SENTENCE SAYING?

A. IT REFERS TO COMPOUNDS THAT HAVE IN THE BASE A DOUBLE RING, PURINE; AND IN THE SUGAR IT HAS A SUGAR AT THE 2' POSITION WITH A METHYL AND OH AT THAT POSITION.

Q. AND THERE'S A CITATION TO SOME FOOTNOTES?

A. YES.

Q. AND CAN YOU JUST LOOK AT THE FOOTNOTES AND TELL US WHOSE WORK IS CITED AT FOOTNOTES 2 THROUGH 5?

A. WELL, 2 THROUGH 5 IS A MIXED LIST OF REFERENCES, SOME OF WHICH -- MOST OF WHICH ARE REFERENCES TO WORK DONE BY INDIVIDUALS AT MERCK, AS WELL AS REFERENCES TO WHAT WORK WE HAD DONE.

Q. AND THAT'S -- THE REFERENCE NUMBER 3 IS PHARMASSET'S WORK?

A. YES.

Q. OKAY. NOW, THE SECOND SENTENCE, GOING BACK TO THE FIRST PAGE OF EXHIBIT 159, THAT SECOND SENTENCE WHICH READS: THE POTENT INHIBITORY ACTIVITY AGAINST HCV REPLICATION OF A NOVEL PYRIMIDINE NUCLEOSIDE, BETA D 2' DEOXY, 2' FLUORO, 2' C-METHYLCYTIDINE HAS RECENTLY BEEN REPORTED.

WHAT COMPOUND IS THAT?

A. THAT'S BEEN REFERRED TO WHAT WE'VE BEEN TALKING ABOUT AS PSI-6130.

Q. NOW, THE THIRD SENTENCE OF THE PARAGRAPH SAYS, THE SYNTHESES AND ANTI-VIRAL ACTIVITY OF SEVERAL PURINE ANALOGS CONTAINING 2' DEOXY, 2' FLUORO -- SURE. I'M SORRY.

"THE 2' DEOXY, 2' FLUORO, 2' C-METHYL RIBOFURANOSYL MOIETY ARE REPORTED HEREIN?"

SO NOW TAKING ALL THREE SENTENCES TOGETHER, CAN YOU EXPLAIN TO THE JURY WHAT IS BEING STUDIED IN THIS PAPER?

A. THE BASIS OF THE STUDY WAS BASICALLY TAKING JEREMY'S SUGAR AND ATTACHING IT TO PURINES, SUCH AS WHAT YOU FIND WITH THE MERCK COMPOUND, AND SEEING WHAT HAPPENS WHEN YOU EXCHANGE THE BASES.

Q. SO WHEN YOU GO FROM A SINGLE RING TO A DOUBLE RING BASE?

A. YES.

Q. OKAY. NOW, IF YOU LOOK AT COMPOUND 12 -- AND SO I THINK IF WE LOOK ON THE SECOND PAGE OF THE EXHIBIT ON THE LOWER RIGHT SIDE?

A. YES.

Q. DO YOU SEE A STRUCTURE THERE?
A. I DO.
Q. AND THEN IT HAS A COUPLE OF VARIABLES ON ONE OF THE RINGS, X AND Y. WHEN YOU LOOK AT COMPOUND 12, CAN YOU TELL THE JURY WHAT ARE THEY LOOKING AT?
A. COMPOUND 12 IS -- IN THE DOUBLE RING IS AN ADENINE, AND THE SUGAR IS THE SUGAR THAT WE REFER TO AS JEREMY'S SUGAR.
Q. NOW, TAKE A LOOK AT COMPOUND 2 ON THE FIRST PAGE.
A. YES.
Q. LOOKING AT COMPOUND 2 ON THE FIRST PAGE, AGAIN, WE HAVE A COUPLE OF VARIABLES HERE, X AND Y. WHAT IS COMPOUND 2?
A. COMPOUND 2 IS THE IDENTICAL BASE AS WE JUST LOOKED AT FOR COMPOUND 12. SO THE DOUBLE RING WITH -- SO IT'S AN ADENINE.
AND NOW THIS TIME IT'S THE SUGAR WITH THE METHYL UP AND THE OH DOWN. SO THE DIFFERENCE THERE IS FLUORINE VERSUS OH.
Q. SO THE ONLY DIFFERENCE BETWEEN 2 AND 12 IS 2' DOWN AND 2 HAS OH AND 12 HAS FLUORINE?
A. THAT'S CORRECT.
Q. NOW, IF YOU TURN TO THE DATA IN TABLE 2 ON PAGE 3 OF EXHIBIT 159?
A. OKAY.
Q. AND, MR. ANG, IF YOU CAN HIGHLIGHT THE ROW FOR COLUMN 12 AND COLUMN 2.
WHEN YOU TAKE COMPOUND 2 AND COMPOUND 12 AND TEST THEM IN REPLICON, WHAT DID THE RESULTS REVEAL?

A. SO AS WE HAD DEMONSTRATED BEFORE IN OTHERS AS WELL, COMPOUND 2 HAS ACTIVITY IN THIS ASSAY, MEANING THAT IT INHIBITS THE VIRUS. IT DOES HAVE SOME CYTOTOXICITY, BUT THE DIFFERENTIAL THERE IS ABOUT 15-FOLD.

HOWEVER, WHEN YOU JUST MAKE THAT BASE CHANGE OR THAT ONE CHANGE IN THE SUGAR AND GO TO COMPOUND 12, NOW YOU LOSE ALL ACTIVITY AND IT BECOMES BASICALLY A DEAD COMPOUND.

SO IF YOU CHANGE OH TO FLUORINE, IN THIS CASE IF IT'S A PURINE, YOU LOSE ALL ACTIVITY.

Q. IF YOU TOOK COMPOUND 12 AND CHANGED THE BASE, THE DEAD COMPOUND, AND CHANGED THE BASE FROM THE DOUBLE RING ADENINE TO THE SINGLE RING CYTISINE, WHAT COMPOUND DO YOU HAVE?

A. WE HAVE 6130.

Q. FINALLY, DR. OTTO, WE HAVE ALREADY HEARD FROM DR. SOFIA ABOUT THE WORK AT PHARMASSET THAT LED TO SOFOSBUVIR. IS IT THE CASE THAT GILEAD ULTIMATELY ACQUIRED PHARMASSET?

A. YES.

Q. AND DO YOU KNOW HOW MUCH GILEAD PAID TO ACQUIRE PHARMASSET?

A. YES. APPROXIMATELY 11 AND A HALF BILLION.

Q. THANK YOU, DR. OTTO.

YOUR HONOR, I HAVE NO FURTHER QUESTIONS AT THIS TIME.

THE COURT: MR. GENDERSON, CROSS-EXAMINATION?

MR. GENDERSON: YES, YOUR HONOR.

/ / /

/ / /

CROSS-EXAMINATION

BY MR. GENDERSON:

Q. GOOD AFTERNOON, DR. OTTO.

A. GOOD AFTERNOON.

Q. MY NAME IS BRUCE GENDERSON, AND I DON'T THINK WE'VE MET.

A. NO, I DON'T THINK SO.

Q. COULD WE PUT UP, MR. SCHLIESSKE, EXHIBIT 1240, PLEASE.

AND DR. OTTO, CAN YOU LOOK IN YOUR NOTEBOOK? DO YOU HAVE THE NOTEBOOK IN FRONT OF YOU, EXHIBIT 1240?

A. I DO.

Q. DO YOU RECOGNIZE THAT DOCUMENT?

A. IT APPEARS TO BE COPIES OF SOME SLIDES PRESENTED AT A MEETING BETWEEN PHARMASSET AND MERCK.

Q. AND WERE SIMILAR OVERVIEWS TO THAT PRESENTED EACH YEAR AT PHARMASSET? WAS THERE A YEARLY OVERVIEW LIKE THAT EXHIBIT PRESENTED AT PHARMASSET EACH YEAR?

A. NO.

Q. WELL, LET'S TAKE A LOOK AT EXHIBIT 1910, PLEASE.

A. 1910?

Q. YEAH. THAT SHOULD BE IN YOUR BINDER AS WELL.

A. I'M LOOKING. I'VE GOT 1901.

Q. AND IT'S ALSO UP ON THE SCREEN IF THAT'S EASIER FOR YOU.

A. IT MIGHT BE.

I'LL LOOK ON THE SCREEN BECAUSE I DON'T SEE IT HERE.

THE COURT: I DON'T EITHER.

THE WITNESS: I DON'T SEE IT IN MY BINDER. I CAN LOOK ON THE SCREEN.

MR. MCMANN: YOUR HONOR, I DON'T HAVE A COPY.

THE COURT: YEAH, I DON'T THINK IT'S IN THE BINDER.

MR. GENDERSON: IS IT IN --

THE CLERK: HE HAS THE BINDER THAT YOU GAVE ME.

MR. GENDERSON: THAT I GAVE YOU?

THE CLERK: YES.

MS. BERNIKER: IT'S EXHIBIT 1901.

MR. GENDERSON: IT'S EXHIBIT 1901, DR. OTTO. MY APOLOGIES.

THE WITNESS: THAT'S OKAY.

BY MR. GENDERSON

Q. AND THAT'S AN OVERVIEW FOR THE YEAR 2002; CORRECT?

A. OH, IT LOOKS LIKE A PRESENTATION OR SLIDES PRESENTED IN NOVEMBER OF 2002.

Q. AND THAT'S AN INTERNAL PHARMASSET DOCUMENT?

A. I HAVE TO LOOK AT IT FOR A MINUTE.

I DIDN'T KNOW IN WHAT CONTEXT THIS WAS PRESENTED, BUT IT APPEARED TO BE AN INTERNAL DOCUMENT.

MR. GENDERSON: YOUR HONOR, WE OFFER 1901 INTO EVIDENCE.

MR. MCMANN: NO OBJECTION, YOUR HONOR.

THE COURT: IT WILL BE ADMITTED.

(DEFENDANTS' EXHIBIT 1901 WAS RECEIVED IN EVIDENCE.)

BY MR. GENDERSON:

Q. OKAY. WE MAY LOOK AT THAT A LITTLE LATER, DR. OTTO, BUT IF YOU COULD PUT IT DOWN FOR A SECOND.

AND I'D LIKE TO DIRECT YOUR ATTENTION TO A ONE-PAGE DOCUMENT WHICH IS EXHIBIT 1709, WHICH IS ALSO IN YOUR BINDER.

A. YES.

Q. AND IF WE CAN TAKE A LOOK AT THE ATTENDEES. THIS IS A SUMMARY OF A MEETING THAT TOOK PLACE BETWEEN MERCK AND PHARMASSET IN JANUARY OF 2001; IS THAT CORRECT?

A. YES.

Q. AND YOU ATTENDED THAT MEETING ON BEHALF OF PHARMASSET, ALONG WITH OTHERS?

A. I DID, I DID.

Q. AND DR. OLSEN AND OTHERS AT MERCK ATTENDED?

A. YES.

MR. GENDERSON: YOUR HONOR, WE OFFER EXHIBIT 1709.

MR. MCMANN: NO OBJECTION.

THE COURT: IT WILL BE ADMITTED.

(DEFENDANTS' EXHIBIT 1709 WAS RECEIVED IN EVIDENCE.)

BY MR. GENDERSON:

Q. COULD YOU TAKE A LOOK, DR. OTTO, AT EXHIBIT 1712, WHICH SHOULD BE IN YOUR BINDER.

A. I HAVE IT.

Q. AND THIS IS A DOCUMENT DATED -- LET'S PUT UP 1-1, PLEASE,

TO MAKE IT EASIER TO LOOK AT.

1712, 1-1, PLEASE. THANK YOU.

THIS IS A PHARMASSET IN TEAM MEETING FOR SEQUENCE DATED MAY 29TH, 2002.

DO YOU RECOGNIZE THIS DOCUMENT, DR. OTTO?

A. NOT SPECIFICALLY. BUT IT LOOKS FAMILIAR.

MR. GENDERSON: YOUR HONOR, WE OFFER EXHIBIT 1712 INTO EVIDENCE.

MR. MCMANN: NO OBJECTION.

THE COURT: IT WILL BE ADMITTED.

(DEFENDANTS' EXHIBIT 1712 WAS RECEIVED IN EVIDENCE.)

BY MR. GENDERSON:

Q. AND UNDER DISCUSSION OF PATENTS, IF YOU LOOK AT THE FIRST HIGHLIGHTED BULLET, IT SAYS MERCK/ISIS HAS HCV. THAT'S HEPATITIS C VIRUS?

A. YES, IT IS.

Q. NUCLEOSIDES VIA PARTNERSHIP; IS THAT RIGHT?

A. YES, THAT'S WHAT IT SAYS.

Q. AND THIS DATE, MAY 29TH, 2002, IS BEFORE THE MERCK PATENT APPLICATION IS PUBLISHED.

DO YOU KNOW HOW PHARMASSET KNEW THAT MERCK AND ISIS WERE IN COLLABORATION FOR HCV BEFORE THERE WAS ANY PUBLICATION?

A. TO THE BEST OF MY KNOWLEDGE, I BELIEVE IT WAS KNOWN IN THE FIELD THAT MERCK AND ISIS WERE WORKING TOGETHER AND THAT THEY HAD AN INTEREST IN HEPATITIS C.

BEYOND THAT, I DON'T KNOW.

Q. OKAY. AND WE'VE HIGHLIGHTED THE NEXT BULLET ON DOWN, OR TWO BULLETS DOWN. IT SAYS, PATENTS ARE OUR LIFEBLOOD; THEY ALLOW US TO SIT AT THE TABLE.

YOU AGREE WITH THAT, DON'T YOU?

A. YES.

Q. AND BELOW THAT IT SAID, OUTSIDE OF THE U.S., FIRST TO PUBLISH IS THE WIN WIN, THUS ONE WANTS TO COVER AS MANY COMPOUNDS AS POSSIBLE.

WAS THAT THE POLICY OF PHARMASSET, DOCTOR?

A. IT CERTAINLY WAS BY SOME, YES.

Q. AND LET'S -- COULD WE TAKE A LOOK, MR. SCHLIESSKE, AT EXHIBIT 524.

THAT'S IN YOUR NOTEBOOK AS WELL, DOCTOR.

AND IF WE CAN PULL UP 1-1.

DOCTOR, THIS IS THE MERCK PUBLISHED APPLICATION. IT'S CALLED A PCT APPLICATION, OR INTERNATIONAL APPLICATION. IT WAS PUBLISHED ON JULY 25, 2012, AND I JUST WANT TO DIRECT YOUR ATTENTION TO THE WO NUMBER, THAT'S THE NUMBER OF THEIR PUBLICATION, AND IT ENDS IN THE DIGITS 425.

DO YOU SEE THAT?

A. I DO.

Q. AND IT SAYS APPLICANTS MERCK AND ISIS; CORRECT?

A. YES.

Q. AND YOU SAW THIS PUBLICATION, IT WAS PUBLISHED ON

JULY 25TH, SHORTLY AFTER IT WAS PUBLISHED; CORRECT?

A. YES.

THE COURT: WHAT WAS THE DATE OF THAT PUBLICATION?

MR. GENDERSON: IT WAS PUBLISHED JULY 25TH, 2002.

THE COURT: 2002, THANK YOU.

MR. GENDERSON: AND THIS PARTICULAR APPLICATION WAS FILED IN JANUARY OF 2002.

Q. AND YOU'RE AWARE THAT THIS PARTICULAR PUBLICATION IS WHAT ISSUED AS THE '499 PATENT; CORRECT?

A. I BELIEVE SO.

Q. AND YOU AND MOST OF YOUR COLLEAGUES AT PHARMASSET WERE AWARE OF THE MERCK PATENTS BECAUSE YOU MONITORED THE PATENT LITERATURE PRETTY CAREFULLY; CORRECT?

A. WE TRIED TO, YES.

Q. AND IF WE LOOK AT EXHIBIT 1892 IN EVIDENCE --

YOUR HONOR, I'M SORRY. I OFFER EXHIBIT 524.

MR. MCMANN: NO OBJECTION, YOUR HONOR.

THE COURT: IT WILL BE ADMITTED.

(DEFENDANTS' EXHIBIT 524 WAS RECEIVED IN EVIDENCE.)

BY MR. GENDERSON:

Q. IF WE LOOK AT EXHIBIT 1892 INTO EVIDENCE, AND IF WE CAN PUT UP 1-1, THIS IS AN E-MAIL CHAIN IN WHICH YOU WERE COPIED. CAN YOU LOOK AT THAT IN THE BOTTOM RIGHT.

DO YOU SEE THAT?

A. YES, I DO.

Q. AND THAT'S YOUR E-MAIL, MOTTO?
A. THAT'S MY E-MAIL.
Q. AND IF YOU LOOK, DR. SCHINAZI WAS REQUESTING COPIES OF MERCK PATENTS, INCLUDING THE ONE WE JUST LOOKED AT, THE '425 PATENT; CORRECT?
A. YES.
Q. AND THAT'S THE ONE THAT ISSUED AS THE '499 PATENT TODAY.
AND FOUR DAYS LATER IT WAS SENT TO HIM, SO PHARMASSET HAD IT WITHIN FOUR DAYS OF PUBLICATION; CORRECT?
A. SURE.
Q. AND DR. -- AND MR. ROBERTS, WHO SENT IT TO HIM, SAID ON THE E-MAIL THAT THE IMPORTANCE WAS -- I'M SORRY.
DR. SCHINAZI SAID IN HIS E-MAIL AT THE TOP THAT THE IMPORTANCE WAS HIGH?
A. OKAY.
Q. IS THAT CORRECT?
A. THAT'S WHAT HE SAID.
Q. ALL RIGHT. LET'S TAKE A LOOK AT EXHIBIT 1893, PLEASE. IF YOU CAN PUT UP 1-1.
DR. OTTO, DO YOU RECOGNIZE THIS DOCUMENT?
A. YES, IT'S A PROGRESS REPORT THAT KYO WATANABE, THE HEAD OF CHEMISTRY, AUTHORED.
Q. AND YOU TYPICALLY RECEIVED COPIES OF THESE REPORTS BY DR. WATANABE; CORRECT?
A. YES, I DID.

Q. AND IN FACT, YOU WOULD TYPICALLY RECEIVE DRAFTS BEFORE THEY ISSUED SO YOU COULD LOOK AT THEM BEFORE THEY WERE SENT OUT; CORRECT?

A. I OFTEN DID, YES.

Q. OKAY. AND IF WE LOOK AT THE SECOND PAGE OF THIS DOCUMENT 2-1, DR. WATANABE SAID, AFTER THOROUGH SCRUTINY OF MERCK PATENTS ON ANTI-HCV NUCLEOSIDES, WE MOVED THE 4' SUBSTITUTED NUCLEOSIDES AND DERIVATIVES THEREFROM TO HIGHER PRIORITY."

IS THAT CORRECT?

A. THAT'S A CORRECT READING OF THAT, THAT'S CORRECT.

Q. OKAY. SO PHARMASSET LOOKED AT THE MERCK PATENT AND USED THE PATENT TO FOCUS ON A PARTICULAR AREA TO WORK IN; CORRECT?

A. YES.

Q. NOW, COULD WE --

YOUR HONOR, WE OFFER EXHIBIT 1893 IN EVIDENCE.

MR. MCMANN: NO OBJECTION, YOUR HONOR.

THE COURT: IT WILL BE ADMITTED.

(DEFENDANTS' EXHIBIT 1893 WAS RECEIVED IN EVIDENCE.)

BY MR. GENDERSON:

Q. COULD WE LOOK AT EXHIBIT 1713, PLEASE.

AND IF WE CAN PUT UP 1-1.

DOCTOR, THIS IS AN E-MAIL CHAIN AND YOU'RE INCLUDED IN THE E-MAIL CHAIN; IS THAT CORRECT?

A. YES.

Q. AND AT THE TIME -- AND THE E-MAIL ON THE TOP IS FROM RFS. THAT'S DR. SCHINAZI?

A. YES.

Q. AND HE WAS CHAIRMAN AT THE TIME?

A. I'M SORRY?

Q. IS THAT CORRECT?

A. WOULD YOU REPEAT IT, PLEASE?

Q. YES. RFS IS DR. SCHINAZI?

A. YES.

Q. AND HE WAS CHAIRMAN OF PHARMASSET AT THE TIME?

A. YES.

MR. GENDERSON: YOUR HONOR, WE OFFER EXHIBIT 1713, PLEASE.

MR. MCMANN: NO OBJECTION, YOUR HONOR.

THE COURT: IT WILL BE ADMITTED.

(DEFENDANTS' EXHIBIT 1713 WAS RECEIVED IN EVIDENCE.)

BY MR. GENDERSON:

Q. SO DR. SCHINAZI IS SAYING AT THE TOP -- HE'S REFERRING TO MERCK PATENTS; CORRECT?

A. YES.

Q. AND HE SAYS, WE NEED TO IDENTIFY THE HOLES IN THEIR PATENT AND IN IDENIX PATENTS AND FILE AS SOON AS POSSIBLE WHILE WE STILL CAN; CORRECT?

A. YES.

Q. AND THAT WAS AN E-MAIL THAT WAS BEING SENT TO YOU?

A. SURE.

Q. NOW, IF WE TAKE A LOOK AT 2-1. THIS IS THE SECOND PAGE OF THIS DOCUMENT.

AND IT INDICATES THAT THE MERCK PATENTS INCLUDE CERTAIN BASES. DO YOU SEE THAT?

A. YES, I DO.

Q. AND IT ALSO SAYS THAT THE MERCK PATENTS DID NOT INCLUDE CERTAIN BASES; CORRECT?

A. YES, IT SAYS THAT.

Q. AND AM I CORRECT THAT THE PURPOSE OF THIS WAS TO SUGGEST THAT WE LOOKED AT THE MERCK PATENTS AND THERE WERE SOME BASES NOT INCLUDED AND WE OUGHT TO LOOK IN THOSE AREAS?

A. ONE COULD ASSUME THAT.

Q. OKAY. IS THAT WHAT YOU UNDERSTAND THE DOCUMENT TO BE SAYING?

A. I BELIEVE THAT'S WHAT DR. SCHINAZI IS SUGGESTING.

Q. SO THE HOLES THAT HE MAY HAVE BEEN TALKING ABOUT WERE THE BASES THAT WERE NOT INCLUDED IN THE PATENTS; CORRECT?

A. YEAH, CORRECT.

Q. CAN WE TAKE A LOOK AT EXHIBIT 1900, PLEASE.

COULD WE HAVE 1-1.

IS THIS ANOTHER PROGRESS REPORT FROM DR. WATANABE?

A. YES, IT IS.

MR. GENDERSON: YOUR HONOR, WE OFFER EXHIBIT 1900 INTO EVIDENCE.

MR. MCMANN: NO OBJECTION, YOUR HONOR.

THE COURT: IT WILL BE ADMITTED.

(DEFENDANTS' EXHIBIT 1900 WAS RECEIVED IN EVIDENCE.)

BY MR. GENDERSON:

Q. OKAY. IF WE COULD LOOK AT THE THIRD PAGE OF THIS DOCUMENT, 3-1.

IS THIS DOCUMENT BASICALLY SUGGESTING THE SAME THING? HERE ARE SOME STRUCTURES THAT ARE NOT COVERED BY THE MERCK PATENTS THAT WE CAN BE WORKING IN?

A. YES, THAT'S WHAT IT SUGGESTS.

Q. OKAY. ALL RIGHT. LET'S TAKE A LOOK -- AND THIS DOCUMENT WAS DATED SEPTEMBER 15TH; IS THAT RIGHT?

A. YEAH -- NO, OCTOBER.

Q. I'M SORRY, OCTOBER 15TH. AND THE ONE BEFORE IS SEPTEMBER.

SO AFTER THE PUBLICATION OF THE MERCK PATENT IN SEPTEMBER AND OCTOBER, THERE ARE A NUMBER OF COMMUNICATIONS ABOUT THE PATENT AND WHAT WORK WE CAN DO -- WHAT PHARMASSET CAN DO BASED ON THAT PATENT?

A. SURE.

Q. COULD WE LOOK AT EXHIBIT 518, PLEASE.

DO YOU RECOGNIZE THIS DOCUMENT, DOCTOR?

A. GIVE ME A SECOND.

YES, I DO.

Q. THIS IS AN APRIL 4TH, 2003, PHARMASSET CHEMISTRY MEETING REPORT?

A. YES.
Q. AND YOU ATTENDED THIS MEETING?
A. YES.
MR. GENDERSON: YOUR HONOR, WE OFFER EXHIBIT 518 INTO EVIDENCE.
MR. MCMANN: NO OBJECTION, YOUR HONOR.
THE COURT: IT WILL BE ADMITTED.
(DEFENDANTS' EXHIBIT 518 WAS RECEIVED IN EVIDENCE.)
BY MR. GENDERSON:
Q. AND FURTHER DOWN THE PAGE, THE FIRST PAGE OF THE DOCUMENT, THE NOTES SAY, MIKE REPLIED.
IS MIKE REFERRING TO YOU?
A. IT MUST BECAUSE I THINK I WAS THE ONLY MIKE THERE.
Q. IF IT WAS A LARGER COMPANY, YOU MIGHT NOT KNOW?
A. IT WAS ME.
Q. "MIKE REPLIED SAYING THAT WE ARE TRYING TO CASH ON THE LOOPHOLES IN THE PATENTS FROM OTHER COMPANIES."
AND THAT'S --
A. WAIT A SECOND. WHERE IS IT?
OH, THERE IT IS. YEAH, YEAH. OKAY.
Q. AND YOU'RE SURE YOU SAID SOMETHING TO THAT EFFECT; CORRECT?
A. SURE.
Q. AND, IN FACT, THAT'S STANDARD OPERATING PROCEDURE TO TRY TO DO THAT; RIGHT?

A. FOR ANY COMPANY, YES.
Q. AND YOU HAVEN'T -- HOW MANY COMPANIES HAVE YOU WORKED FOR IN YOUR CAREER?
A. SIX, I THINK.
Q. BUT IT WAS CERTAINLY STANDARD OPERATING PROCEDURE AT PHARMASSET?
A. YES.
Q. OKAY. NOW, I WANT TO TURN TO THE IDEA FOR THE COMPOUND THAT MR. CLARK MADE THAT IS NOW CALLED 6130.
A. OKAY.
Q. OKAY. SO IF I UNDERSTAND, IN NOVEMBER OF 2002 YOU HAD A MEETING WITH THE CHEMISTS AND YOU CHALLENGED THEM TO FIND LOOPHOLES IN THE MERCK PATENT; CORRECT?
A. IN THE LITERATURE, INCLUDING THE MERCK PATENT, YES.
Q. OKAY. AND MR. CLARK ATTENDED THAT MEETING?
A. YES, HE DID.
Q. AND THIS WAS OBVIOUSLY AFTER THE PATENT THAT WE LOOKED AT EARLIER THE MERCK PUBLICATION WAS PUBLISHED; RIGHT?
A. YES.
Q. AND MR. CLARK WAS THE PERSON WHO CAME BACK SEVERAL DAYS LATER AND SAID, I THINK I FOUND SOMETHING?
A. HE CAME TO ME AND SAID HE HAD SOME IDEAS, YES.
Q. AND HE SHOWED YOU THE IDEAS, AND ONE OF THE COMPOUNDS THAT HE HAD DRAWN OUT WAS A COMPOUND THAT ENDED UP BEING 6130; CORRECT?

A. THAT'S CORRECT.

Q. AND HE BROUGHT COPIES OF THE MERCK APPLICATION WITH HIM TO THAT MEETING; CORRECT?

A. YES, HE DID.

Q. AND YOU TESTIFIED THAT YOU LOOKED AT THE MERCK APPLICATION AND YOU DIDN'T SEE ANY EXAMPLES WITH THE 2' FLUOROMETHYL?

A. THAT'S CORRECT.

Q. OKAY. BUT YOU'RE NOT A CHEMIST, ARE YOU, SIR?

A. I AM NOT.

Q. AND IF I UNDERSTAND YOUR -- ARE YOU CAPABLE OF LOOKING AT A GENERIC FORMULA AND DETERMINING IF SOMETHING IS WITHIN THE GENERIC FORMULA?

A. FROM MY PERSPECTIVE WHEN I LOOK AT A PATENT AS A BIOLOGIST, WHAT I LOOK FOR IS STRUCTURES THAT ARE EXEMPLIFIED SO I'M SURE THAT THE PATENT IS GOING TO COVER THOSE, AND I LOOK FOR DATA THAT WOULD SUPPORT THE CONTENTION THAT THAT'S WHAT THEY'RE WORKING ON.

BUT I'M NOT CAPABLE -- BUT I'M REALLY NOT CAPABLE OF GOING THROUGH A PATENT AND, AMONGST THE MILLIONS OF COMPOUNDS, FINDING INDIVIDUAL COMPOUNDS.

Q. OKAY. SO YOU CAN LOOK AT A SPECIFIC STRUCTURE THAT IS DRAWN OUT AS AN EXAMPLE; CORRECT?

A. YES.

Q. BUT YOU COULDN'T LOOK AT A GENERAL FORMULA AND DETERMINE IF SOMETHING IS OR IS NOT WITHIN THAT FORMULA; IS THAT FAIR?

A. THAT'S CORRECT. I NEED A PATENT LAWYER TO HELP ME WITH THAT.

Q. OKAY. BUT YOU DID NOTICE IN THIS -- IN THE PATENT THAT THERE WERE 146 EXAMPLES?

A. SOMETHING LIKE THAT.

Q. SPECIFIC EXAMPLES?

A. YES.

Q. ALL DRAWN OUT?

A. YEAH, I BELIEVE SO.

Q. WITH INFORMATION ON A LOT OF THEM ABOUT HOW TO MAKE THEM OR CITATIONS TO THE LITERATURE?

A. YEAH, I BELIEVE IN MOST CASES, YEAH.

Q. AND YOU DIDN'T LOOK AT THE CLAIMS TO SEE WHETHER THE CLAIMS INCLUDED MR. CLARK'S PROPOSED COMPOUND BECAUSE YOU WOULDN'T HAVE BEEN ABLE TO DO THAT; CORRECT?

A. I BELIEVE THAT'S CORRECT.

Q. OKAY. AND AFTER THAT, MR. CLARK STARTED WORKING ON SYNTHESIZING HIS COMPOUND; CORRECT?

A. YES.

Q. AND THAT -- SO HE STARTED -- HE WENT THROUGH THIS PROCESS AFTER -- HE CLEARLY WAS AWARE OF THE MERCK PATENT BECAUSE HE BROUGHT IT WITH HIM AT THE TIME WHERE HE FIRST TOLD YOU ABOUT HIS IDEA TO MAKE THIS COMPOUND; CORRECT?

A. SURE.

Q. AND HE HAD LOOKED AT THE MERCK PATENT?

A. SURE.
Q. COULD WE TAKE A LOOK AT EXHIBIT 512, PLEASE.
DR. OTTO, DO YOU RECOGNIZE THIS DOCUMENTS? THIS IS A JANUARY 17TH, 2003, CHEMISTRY GROUP MEETING?
A. NO. I BELIEVE THIS IS A PROGRESS REPORT. THIS IS 512 YOU SAID?
OH, I'M SORRY. I'M LOOKING AT 513.
Q. JANUARY 17TH, 2003. I BELIEVE YOU TESTIFIED ABOUT IT IN YOUR DEPOSITION.
A. I WAS LOOKING AT THE WRONG ONE.
Q. OH, I'M SORRY.
A. SO 512?
Q. YES.
A. YES, CHEMISTRY MEETING NOTES.
MR. GENDERSON: YOUR HONOR, WE OFFER 512 INTO EVIDENCE.
MR. MCMANN: NO OBJECTION, YOUR HONOR.
THE COURT: IT WILL BE ADMITTED.
(DEFENDANTS' EXHIBIT 512 WAS RECEIVED IN EVIDENCE.)
BY MR. GENDERSON:
Q. SO THIS IS A MEETING AFTER MR. CLARK HAD STARTED WORKING ON HIS COMPOUND?
A. YES.
Q. AND THIS IS IN EARLY JANUARY 2003; IS THAT CORRECT?
A. THAT'S CORRECT.

Q. AND WE'VE HIGHLIGHTED SOME LANGUAGE IN A DISCUSSION UNDER DR. WATANABE. THE SECOND BULLET REFERS TO, BASED ON NEW LEADS FROM IDENIX, MERCK AND ROCHE THE FUTURE FOCUS IS TO, AND THEN THERE'S A DISCUSSION OF NEW COMPOUNDS TO MAKE; IS THAT FAIR?

A. THAT'S CORRECT.

Q. AND SO YOU AND YOUR SCIENTISTS WERE LOOK AT THE MERCK PATENT AND OTHER PATENTS FOR LEADS TO HELP GUIDE THEIR WORK; CORRECT?

A. WE'RE LOOKING FOR HOLES, IF YOU WILL. WE'RE LOOKING TO SEE WHAT THEY WERE DOING. SO THE ANSWER IS, YES.

Q. AND, DOCTOR, THE MERCK COMPOUND THAT IS --

I'M SORRY. COULD WE GO TO 1-2, PLEASE.

IS THIS 1-2?

OKAY. THE MERCK COMPOUND THAT IS REFERRED TO FOR MERCK, THAT WAS A COMPOUND WITH AN ADENOSINE BASE AND A 2' METHYL?

A. ACTUALLY I BELIEVE IT WAS AN ADENOSINE BASE WITH A 2' O METHYL.

Q. A 2' O METHYL?

A. YEAH, I BELIEVE SO.

Q. SO THAT'S A DIFFERENT ONE THAN THE ONE YOU TESTIFIED TO ON DIRECT?

A. I'M SORRY?

Q. IS THAT THE SAME COMPOUND THAT YOU TESTIFIED ABOUT THAT YOU REFERRED TO AS THE MERCK COMPOUND?

A. IT IS -- IT IS A SIMILAR COMPOUND. IT IS DIFFERENT, YES.

Q. BUT YOU UNDERSTOOD THAT A COMPOUND WITH A 2' METHYL UP AND HYDROXY DOWN WAS A COMPOUND -- 2' METHYL UP, HYDROXY DOWN WITH AN ADENOSINE BASE WAS A COMPOUND THAT MERCK WAS WORKING ON?

A. YES, WE WERE AWARE OF THAT.

Q. AND YOU REFERRED TO THAT INTERNALLY AS THE MERCK COMPOUND; CORRECT?

A. AT SOME POINT WE DID, YES.

Q. AND YOU'RE AWARE, AREN'T YOU, THAT THAT COMPOUND IS DIFFERENT IN TERMS OF THE BASE THAN THE COMPOUND THAT MERCK ULTIMATELY TRIED TO DEVELOP AND PUT INTO CLINICAL TRIALS?

A. YES, THAT'S TRUE.

Q. SO THIS IS -- IN FACT, THE COMPOUND THAT YOU REFERRED TO AS A MERCK COMPOUND WAS AN OLDER COMPOUND, A MUCH OLDER COMPOUND.

WERE YOU AWARE OF THAT?

A. I HAVE NO IDEA OF THE TIMING. I DON'T KNOW WHICH ONE IS OLDER. WE JUST KNEW THAT THEY WERE WORKING.

Q. WE'LL HEAR TESTIMONY ABOUT THAT IN OUR CASE. I THOUGHT YOU MIGHT BE AWARE OF IT.

A. NO, I DIDN'T KNOW.

Q. DOCTOR, WHEN MR. CLARK WAS HIRED AND FIRST STARTED AT PHARMASSET, HE HAD NO PRIOR NUCLEOSIDE CHEMISTRY EXPERIENCE?

A. I DON'T THINK SO.

Q. AND HE HAD NO FLUORINE CHEMISTRY EXPERIENCE TO YOUR KNOWLEDGE; CORRECT?

A. NOT TO MY KNOWLEDGE.
Q. AND AM I CORRECT THAT MR. CLARK SUCCEEDED IN MAKING HIS COMPOUND ON THE FIRST ATTEMPT?
A. NO.
Q. IT WAS NOT THE FIRST ATTEMPT?
A. NO.
Q. WAS IT THE SECOND ATTEMPT?
A. I DON'T KNOW. BUT IT WAS MANY MONTHS OF, OF WORK TO GET IT THERE.
Q. WELL, IT CAN SOMETIMES TAKE MANY MONTHS TO MAKE A SINGLE COMPOUND, CAN'T IT?
A. SURE IT CAN.
Q. CAN WE TAKE -- CAN I HAVE -- YOUR HONOR, CAN I APPROACH THE WITNESS WITH A DEPOSITION TRANSCRIPT?
THE COURT: SURE.
THE WITNESS: THANK YOU.
BY MR. GENDERSON:
Q. CAN WE PUT UP -- THIS IS IDENIX.
DO YOU HAVE COPIES?
MR. MCMANN: THANK YOU.
MR. GENDERSON: CAN WE PUT UP TMO 3130-1.
THE COURT: WHOSE DEPOSITION IS THIS?
MR. GENDERSON: THIS IS DR. OTTO'S.
MR. MCMANN: I DON'T KNOW THE PAGE AND LINE.
MR. GENDERSON: IT'S PAGE 145, LINES 8 TO 10.

WOULD YOU LIKE A COPY, YOUR HONOR?

THE COURT: IF YOU'RE JUST GOING TO READ A SMALL PART, THAT'S FINE.

MR. GENDERSON: YEAH, JUST SMALL.

Q. THIS IS A DEPOSITION THAT YOU GAVE IN AUGUST OF 2013. DO YOU RECALL THAT?

A. YES.

Q. AND DO YOU RECALL BEING ASKED, SO HIS FIRST SCHEME THAT HE CAME UP WITH WAS THE SUCCESSFUL SCHEME?

AND YOU SAID, I THINK SO?

A. YES.

Q. DOCTOR, I WANT TO SHOW YOU EXHIBIT 12 -- I'M SORRY, 1721. DO YOU RECOGNIZE THIS DOCUMENT? THIS IS A MAY 23RD, 2003, MEETING?

A. YES.

MR. GENDERSON: YOUR HONOR, WE OFFER 1721 INTO EVIDENCE.

MR. MCMANN: NO OBJECTION, YOUR HONOR.

THE COURT: IT WILL BE ADMITTED.

(DEFENDANTS' EXHIBIT 1721 WAS RECEIVED IN EVIDENCE.)

BY MR. GENDERSON:

Q. AND THIS IS A CHEMISTRY MEETING AT PHARMASSET IN MAY OF 2003 AND YOU WERE ONE OF THE ATTENDEES; CORRECT?

A. I WAS, YES.

Q. AND COULD WE LOOK AT 1-2, PLEASE.

AND THERE WAS A DISCUSSION OF BIOLOGICAL DATA AND ACTIVITY OF 6130.

THAT'S MR. CLARK'S COMPOUND; CORRECT?

A. CORRECT.

Q. AND THEN THERE'S A COMPARISON TO, AND THERE'S A LIST OF SEVERAL COMPOUNDS, AND ONE OF WHICH IS PSI-5557; CORRECT?

A. CORRECT.

Q. AND THAT'S THE COMPOUND THAT YOU REFER TO AS THE MERCK COMPOUND INTERNALLY?

A. YES.

Q. AND PSI-6130 SHOWED TO BE THE SECOND MOST POTENT COMPOUND ON THE LIST?

A. YES.

Q. AND WHAT WAS THE MOST POTENT COMPOUND?

A. 5557.

Q. THAT'S THE MERCK COMPOUND?

A. YES.

Q. AND YOU USED THAT COMPOUND AS A POSITIVE CONTROL OR COMPARATIVE IN TESTING NEW COMPOUNDS; IS THAT FAIR?

A. WE HAVE FOR A LONG TIME, YES.

Q. CAN WE TAKE A LOOK AT EXHIBIT 1721, PLEASE.

THIS IS ALREADY IN EVIDENCE, YOUR HONOR.

THE COURT: ALL RIGHT.

BY MR. GENDERSON:

Q. THIS IS THE NOTES FROM A MAY 23RD CHEMISTRY MEETING THAT

YOU TESTIFIED ABOUT ON YOUR DIRECT EXAMINATION. DO YOU RECALL THAT?

A. YES.

Q. AND CAN WE PUT UP 1-3, PLEASE.

AND YOU TESTIFIED ABOUT THIS PARTICULAR SENTENCE.

MJO IS YOU; CORRECT?

A. THAT'S CORRECT.

Q. AND YOU SUGGESTED, MAKING THE BROMO ANALOG OF 6130 TO PROVE MERCK'S CLAIM OF HALOGEN AT THE 2' POSITION IS INVALID?

A. I DID SAY THAT.

Q. AND THEN PSI -- THAT'S PHARMASSET?

A. YES.

Q. -- CAN HAVE CLAIMS ON THE 6130 COMPOUND?

A. THAT'S WHAT I SAID.

Q. NOW, HALOGEN IS A CLASS OF SUBSTITUENTS THAT HAVE REALLY FOUR: THEY HAVE FLUORINE, BROMO, IODINE, AND CHLORO; IS THAT CORRECT?

A. THAT'S CORRECT.

Q. AND WHAT YOU WERE SUGGESTING HERE IS THAT YOU NEEDED TO FIND SOME WAY TO INVALIDATE THE MERCK PATENT, AND YOU WERE SUGGESTING MAKING THIS BROMO COMPOUND AND IF IT WAS INACTIVE THAT MIGHT HELP YOU INVALIDATE; IS THAT FAIR?

A. MY OPINION WAS THAT THE MERCK PATENT WAS NOT VALID BECAUSE IT HADN'T DONE THE WORK, AND THAT I WANTED SOME EVIDENCE THAT IF YOU USE THE BROADEST CLAIM OF A HALOGEN AND I FOUND THAT IT

WAS INACTIVE, THEN I FELT, NOT AS A LAWYER, THAT I FELT THAT IT WOULD HELP TO INVALIDATE THE PATENT.

Q. AND YOU KNEW THE REASON YOU WERE DOING THIS, IS THAT YOU KNEW AT THIS POINT THAT THE CLAIM OF THE MERCK PATENT COVERED 6130?

A. I DID KNOW AT THIS POINT THAT THE MERCK PATENT DID CLAIM -- YOU COULD FIND THAT COMPOUND IN THE CLAIMS, YES.

Q. SO IF THE MERCK PATENT WAS VALID AND YOU SOLD A PRODUCT WITH 6130, IT WOULD INFRINGE THE MERCK PATENT? YOU UNDERSTOOD THAT?

A. NO, I DIDN'T UNDERSTAND THAT.

Q. BUT YOU KNEW IT WAS COVERED BY THE PATENT?

A. I KNEW IT WAS CLAIMED BY THE PATENT, BUT I DIDN'T BELIEVE IT WAS COVERED BY THE PATENT.

I DIDN'T BELIEVE THAT PART OF THE PATENT WAS VALID. THAT WAS MY OPINION.

Q. BUT YOU KNEW IT WAS CLAIMED IN THE PATENT, THAT THE CLAIM --

A. YEAH, THAT THE CLAIMS -- YOU COULD FIND IT IN THE CLAIMS, ABSOLUTELY.

Q. AND YOU BELIEVED THAT THE BROMO COMPOUND WAS ACTUALLY MADE, CORRECT?

A. NO, IT WASN'T MADE.

Q. IT WAS NOT MADE?

A. NO.

Q. ARE YOU SURE?
A. YES.
Q. DID YOU GO BACK AND CHECK?
A. NO, BECAUSE I KNEW SHORTLY AFTER THAT IT WASN'T MADE BECAUSE THE CHEMISTS COULDN'T FIND A WAY TO MAKE IT.
Q. AND WHEN DID YOU LEARN THAT? SHORTLY AFTER --
A. I DON'T REMEMBER.
Q. AFTER THIS MEMO IN 2003?
A. NO. IT WAS SOME TIME AFTER THIS.
Q. HOW LONG AFTER THAT?
A. I DON'T RECALL.
Q. LESS THAN A YEAR?
A. I DON'T RECALL.
Q. LESS THAN TWO YEARS?
A. I REALLY DON'T RECALL WHEN IT WAS ATTEMPTED AND NOT MADE.
Q. OKAY. ARE THERE ANY RECORDS THAT YOU'RE AWARE OF AN ATTEMPT TO MAKE THIS COMPOUND?
A. I'M NOT AWARE OF.
Q. AND YOU'RE NOT AWARE OF ANY RECORDS?
A. NO.
Q. CAN WE TAKE A LOOK AT EXHIBITS 1721, 2-1, PLEASE.
THIS IS ANOTHER STATEMENT ON THE SECOND PAGE THAT YOU MADE ON THIS DOCUMENT?
A. YES.
Q. AND YOU STATED THAT 6130 IS THE FIRST COMPOUND MADE BY A

PSI CHEMIST THAT IS ACTIVE AGAINST HCV?

A. THAT'S CORRECT.

Q. AND IS THAT A CORRECT STATEMENT?

A. IT'S CORRECT IN THE SENSE THAT THAT WAS THE FIRST TIME THAT A NOVEL COMPOUND WAS MADE BY PHARMASSET THAT HAD BOTH ACTIVITY AND WASN'T TOXIC IN A SENSE.

WE HAD MADE OTHER COMPOUNDS THAT HAD ACTIVITY, INCLUDING 5557, BUT THIS IS THE FIRST ONE THAT WAS NOVEL TO PHARMASSET.

Q. AND THIS WAS MADE AFTER REVIEWING THE MERCK PATENTS; CORRECT?

A. SURE.

Q. COULD WE TAKE A LOOK AT EXHIBIT 1904, PLEASE.

THIS IS ALSO IN EVIDENCE, YOUR HONOR.

AND IF WE COULD PUT UP 1-1.

THIS IS AN E-MAIL FROM DR. SCHINAZI IN MAY OF 2003; IS THAT CORRECT?

A. YES.

Q. AND IT SAID -- IT SAYS, JEREMY --

THAT'S REFERRING TO MR. CLARK?

A. YES, IT IS.

Q. -- IS ON VACATION FOR THE NEXT 2 WEEKS, SO I DISCUSSED THIS WITH MJO.

THAT'S YOU?

A. THAT'S ME.

Q. AND IT SAYS, MICHAEL INDICATED THAT HE AND WILLIAM --

WHO IS WILLIAM?

A. WILLIAM WAS IN-HOUSE COUNSEL, PATENT COUNSEL.

Q. -- BOTH REVIEWED THE IDENIX AND MERCK PATENTS. SPECIFICALLY, HE INDICATED THAT -- AND THEN IF YOU GO TO B REGARDING MERCK, THERE'S A METHYL UP AND FLUORINE DOWN IN BOTH THE 2' AND 3' POSITIONS; RIGHT?

A. YES.

Q. AND SO AT LEAST IN MAY YOU WERE AWARE THAT THE MERCK PATENTS INCLUDED 2' METHYL UP AND FLOURINE DOWN; CORRECT?

A. DR. WILLIAM SAT DOWN AND HE SHOWED IT TO ME AFTER MANY HOURS -- SORRY. WILLIAM WAS ABLE TO SHOW IT TO ME, THAT IT WAS THERE.

Q. COULD WE TAKE A LOOK AT EXHIBIT 523, PLEASE.

DR. OTTO, DO YOU RECOGNIZE THIS DOCUMENT? IT'S A JUNE 16TH, 2003, MEETING MINUTES AND YOU'RE LISTED AS AN ATTENDEE?

A. YES.

MR. GENDERSON: YOUR HONOR, WE OFFER EXHIBIT 523 INTO EVIDENCE.

MR. MCMANN: NO OBJECTION, YOUR HONOR.

THE COURT: IT WILL BE ADMITTED.

(DEFENDANTS' EXHIBIT 523 WAS RECEIVED IN EVIDENCE.)

BY MR. GENDERSON:

Q. SO THIS IS NOW IN JUNE OF 2003. THIS IS AFTER MR. CLARK HAD FINISHED MAKING HIS COMPOUND; CORRECT?

A. THAT IS CORRECT.
Q. AND THE MINUTES INDICATE THAT FOUR PATENT APPLICATIONS WERE DISCUSSED?
A. YES, I SEE THREE.
Q. AND DO YOU SEE THAT'S THE SECOND BULLET? I'VE HIGHLIGHTED IT ON THE SCREEN, DOCTOR. IT MIGHT BE EASIER FOR YOU.
A. THANK YOU. YES, I SEE THAT.
Q. AND THEN IF YOU LOOK AT NUMBER 3, IT'S REFERRING TO MERCK PATENT APPLICATION WITH THIS LONG WO, NUMBER BUT THAT'S 425 AT THE END?
A. YES, IT IS.
Q. AND THAT'S THE PATENT APPLICATION THAT WAS PUBLISHED IN JULY OF 2002 THAT WE LOOKED AT EARLIER?
A. YES.
Q. AND IT'S THE APPLICATION THAT RESULTED IN THE '499 PATENT AT ISSUE HERE; CORRECT?
A. OKAY, YES.
Q. AND IT SAYS, THIS APPLICATION CLAIMED 2' SUBSTITUTED (MOST OF GROUPS) NUCLEOSIDES COMBINED WITH 4' SUBSTITUTED WITH METHYL, HYDROXYMETHYL AND FLUOROMETHYL.
DO YOU SEE THAT?
A. I SEE THAT.
Q. AND THEN THE NEXT BULLET -- I'M NOT GOING TO READ IT OUT LOUD, BUT IT SUGGESTS THAT THERE WERE CERTAIN 2' METHYL FLUORO COMPOUNDS THAT COULD BE COMBINED WITH SOME -- WITH 4'

SUBSTITUENTS THAT WEREN'T COVERED BY THE MERCK CLAIMS; IS THAT RIGHT?

A. I HAVE TO READ IT BECAUSE I'M NOT SURE WHAT YOU'RE SAYING.

Q. OKAY. WHY DON'T YOU TAKE YOUR TIME AND READ THAT PARAGRAPH TO YOURSELF?

A. OKAY.

(PAUSE IN PROCEEDINGS.)

THE WITNESS: OKAY. SO IT SAYS THAT, WHOEVER MADE THIS STATEMENT, THAT THE BASES THAT THE 4' SUBSTITUTED BASIS WERE NOT INCLUDED IF THEY HAD A SUGAR WITH FLUORINE DOWN AND METHYL UP.

BY MR. GENDERSON:

Q. WELL, DOCTOR, THE 4' SUBSTITUENT IS PART OF THE SUGAR. THE 2', IF IT'S ON THE RIGHT-HAND SIDE OF THE SUGAR, AND THEN THE 3' IS ON THE LEFT AND THE 4 IS ABOVE THE 3'; CORRECT?

A. THAT'S CORRECT.

Q. AND SO IT'S PART OF THE SUGAR.

AND ISN'T WHAT THIS IS SAYING IS THAT THERE ARE CERTAIN FLUOROMETHYL COMPOUNDS THAT ARE NOT COVERED BY THE MERCK CLAIMS BECAUSE THE 4' SUBSTITUENTS AREN'T COVERED. LET'S TRY TO SEE IF WE CAN MAKE SOME OF THOSE.

A. YES.

Q. AND AM I CORRECT THAT YOU DID, IN FACT, TRY TO MAKE SOME OF THESE COMPOUNDS THAT WOULD NOT BE COVERED BY THE MERCK CLAIMS?

A. I DON'T RECALL IF WE DID OR NOT.
Q. BUT IF YOU DID, THEY WEREN'T SUCCESSFUL BECAUSE WE HAVE NO EVIDENCE OF ANY; RIGHT?
A. I WOULD GUESS IF THEY WERE SUCCESSFUL WE WOULD BE TALKING ABOUT THOSE.
Q. AND SO YOU TRIED TO FIND COMPOUNDS OUTSIDE OF THE CLAIMS AND YOU IDENTIFIED SOME, BUT YOU COULDN'T FIND ANY GOOD ONES; IS THAT FAIR?
A. WE DID NOT FIND ANYTHING THAT WE'RE TALKING ABOUT.
Q. AND INSTEAD, PHARMASSET CONTINUED TO DEVELOP 6130 EVEN THOUGH IT WAS WITHIN THE SCOPE OF THE MERCK CLAIMS; CORRECT?
A. YEAH, BECAUSE WE BELIEVED THAT IT WASN'T.
Q. CAN WE TAKE A LOOK AT EXHIBIT 1921, PLEASE.
DOCTOR, THIS IS A BUSINESS DEVELOPMENT OVERVIEW DATED AUGUST 10, 2004. DO YOU RECOGNIZE THIS DOCUMENT?
IT MAY JOG YOUR RECOLLECTION. YOU RECEIVED A COPY OF THIS FROM KARIEN STUETZLE.
A. KARIEN, HER NAME IS KARIEN.
Q. KARIEN?
A. YES.
Q. AND DO YOU RECALL THIS DOCUMENT?
A. NOT SPECIFICALLY, BUT IT LOOKS LIKE SOMETHING THAT WE WOULD HAVE PRODUCED.
MR. GENDERSON: YOUR HONOR, WE OFFER 1921 INTO EVIDENCE.

MR. MCMANN: NO OBJECTION, YOUR HONOR.

THE COURT: IT WILL BE ADMITTED.

(PLAINTIFF'S EXHIBIT 1921 WAS RECEIVED IN EVIDENCE.)

BY MR. GENDERSON:

Q. DOCTOR, LET'S TAKE A LOOK AT THE SECOND PAGE, IF WE CAN PUT UP 2-1.

SO THIS IS DISCUSSING PARTNERING DISCUSSIONS WITH VARIOUS PHARMACEUTICAL COMPANIES. IS THAT FAIR? IS THAT CORRECT?

A. YES.

Q. AND THIS IS IN 2004?

A. YES.

Q. AND WITH REGARD TO MERCK, THERE WERE DISCUSSIONS WITH PAMELA DEMAIN AND DOUG PON; IS THAT RIGHT?

A. THAT'S WHAT THIS SAYS.

Q. AND IT SAYS, "MERCK HAS POTENTIAL I.P. IN THE SAME SPACE AND THE VALUE OF THEIR I.P. HAD TO BE TAKEN INTO CONSIDERATION."

IS THAT CORRECT?

A. THAT'S WHAT HE SAID.

Q. AND THEN IT GOES ON TO SAY, "THIS WOULD HAVE RESULTED IN A 50 PERCENT REDUCTION FROM THE ORIGINAL OFFER"?

A. THAT'S WHAT HE PUT IN THERE.

Q. AND COULD WE TAKE A LOOK AT 3-1, PLEASE.

SO, DOCTOR, THERE WERE OTHER PARTNERS THAT WERE DISCUSSED. PFIZER WAS ANOTHER PHARMACEUTICAL COMPANY THAT THEY WERE HAVING

DISCUSSIONS WITH; IS THAT CORRECT?

A. THAT'S CORRECT.

Q. AND PFIZER WAS CONCERNED ABOUT MERCK'S I.P.; RIGHT?

A. YES.

Q. AND ROCHE WAS ANOTHER PARTY THAT YOU WERE HAVING CONVERSATIONS WITH?

A. YES.

Q. AND UNDER ROCHE IT SAYS ONGOING NEGOTIATIONS?

A. YES.

Q. AND YOU ENDED UP LICENSING 6130 TO ROCHE?

A. WE DID.

MR. GENDERSON: YOUR HONOR, COULD I HAVE A SECOND?

THE COURT: OF COURSE.

MR. GENDERSON: THANK YOU.

(PAUSE IN PROCEEDINGS.)

BY MR. GENDERSON:

Q. DOCTOR, THANK YOU VERY MUCH. I HAVE NO FURTHER QUESTIONS.

A. YOU'RE WELCOME.

THE COURT: ANY REDIRECT FOR THIS WITNESS?

MR. MCMANN: NO FURTHER QUESTIONS, YOUR HONOR.

THE COURT: THANK YOU. MAY DR. OTTO BE EXCUSED?

MR. GENDERSON: YES, YOUR HONOR.

THE COURT: DR. OTTO, THANK YOU FOR YOUR TESTIMONY. YOU'RE FREE TO GO.

THE WITNESS: THANK YOU VERY MUCH.

MR. MCMANN: YOUR HONOR, MAY DR. OTTO REMAIN IN THE COURTROOM.

MR. GENDERSON: I HAVE NO OBJECTION.

THE COURT: YES, YOU CERTAINLY MAY.

THE WITNESS: THANKS VERY MUCH.

THE COURT: MS. BROOKS, YOUR NEXT WITNESS.

MS. BROOKS: THANK YOU, YOUR HONOR. OUR NEXT WITNESS WILL BE BY VIDEO, AND THAT'S ROGER POMERANTZ, AND THAT'S SPELLED P-O-M-E-R-A-N-T-Z.

DR. POMERANTZ WORKED AS MERCK'S GLOBAL HEAD OF INFECTIOUS DISEASES AND ALSO THE HEAD OF MERCK'S LICENSING, ACQUISITIONS, AND BUSINESS DEVELOPMENT.

(THE VIDEOTAPED DEPOSITION OF ROGER POMERANTZ WAS PLAYED.)

MS. BROOKS: THAT'S THE END OF THE DEPOSITION OF DR. POMERANTZ, YOUR HONOR, AND IN THAT DEPOSITION THE FOLLOWING EXHIBITS WERE INTRODUCED:

EXHIBIT 60, EXHIBIT 61, EXHIBIT 65, EXHIBIT 66, EXHIBIT 69, EXHIBIT 73, AND EXHIBIT 77.

MR. GENDERSON: NO OBJECTION, YOUR HONOR.

THE COURT: ALL RIGHT. I WILL ADMIT ALL OF THOSE.

(PLAINTIFF'S EXHIBIT 60, 61, 65, 66, 69, 73, AND 77 WERE RECEIVED IN EVIDENCE.)

THIS MIGHT BE A GOOD TIME FOR A BREAK.

MS. BROOKS: IT WILL BE GOOD, YOUR HONOR. WE'LL CALL OUR NEXT WITNESS AFTER THIS.

THE COURT: ALL RIGHT. LET'S TAKE A TEN MINUTE BREAK.

(RECESS FROM 2:48 P.M. UNTIL 3:03 P.M.)

THE COURT: PLEASE BE SEATED. ALL OF OUR JURORS ARE BACK.

ALL RIGHT. MS. BROOKS, YOUR NEXT WITNESS?

MS. BROOKS: THANK YOU, YOUR HONOR. THAT IS GOING TO BE DR. CHRISTOPH SEEGER.

BUT BEFORE DR. SEEGER TESTIFIES, TWO THINGS, YOUR HONOR. JUST SO THE RECORD IS CLEAR, PSI-7977 THAT WAS REPEATEDLY REFERRED TO IN DR. POMERANTZ'S DEPOSITION IS SOFOSBUVIR, SO THE RECORD IS CLEAR ON THAT.

AND IF YOUR HONOR COULD READ STIPULATED FACTS 1 AND 2 NOW TO THE JURY BEFORE THE -- EXCUSE ME -- BEFORE THE TESTIMONY OF DR. SEEGER.

THE COURT: YES.

MS. BROOKS: AND MR. FARRELL WILL BE DOING THE EXAMINATION.

THE COURT: THANK YOU.

ALL RIGHT. LADIES AND GENTLEMEN, DURING A TRIAL THE PARTIES OFTEN GET TOGETHER AND DETERMINE CERTAIN FACTS THAT THEY AGREE ARE TRUE.

I'M GOING TO READ TO YOU TWO FACTS THAT THE PARTIES HAVE AGREED ARE TRUE AND YOU MUST CONSIDER THESE FACTS AS HAVING BEEN ESTABLISHED AND BEING TRUE IN THIS CASE SO THAT THEY'RE

NOT FOR YOU TO DECIDE ONE WAY OR THE OTHER.

NUMBER 1. NONE OF THE COMPOUNDS DESCRIBED BY THE STRUCTURE IN THE 154 EXAMPLES IN THE SHARED SPECIFICATIONS OF THE '499 AND '712 PATENTS-IN-SUIT ARE RECITED WITHIN THE ASSERTED CLAIMS.

NUMBER 2. AS OF THE DATE THE APPLICATION FOR THE PATENT-IN-SUIT WAS FILED, JANUARY 18TH, 2002, DEFENDANTS HAD NOT TESTED ANY COMPOUNDS RECITED WITHIN THE ASSERTED CLAIMS OR ANY PRODRUGS OF THOSE COMPOUNDS FOR BIOLOGICAL ACTIVITY OR FOR TOXICITY.

ALL RIGHT.

DOCTOR, THANK YOU. PLEASE STAND TO BE SWORN.

THE CLERK: PLEASE RAISE YOUR RIGHT HAND.

(PLAINTIFF'S WITNESS, CHRISTOPH SEEGER, WAS SWORN.)

THE WITNESS: YES. THANK YOU.

THE CLERK: PLEASE BE SEATED.

AND IF YOU WOULD STATE YOUR NAME AND SPELL YOUR LAST NAME FOR THE RECORD.

THE WITNESS: CHRISTOPH SEEGER, S-E-E-G-E-R.

MR. FARRELL: WITH THE COURT'S PERMISSION, MAY I APPROACH?

THE COURT: THANK YOU, MR. FARRELL. YES.

MR. FARRELL: MAY IT PLEASE THE COURT?

THE COURT: YES.

MR. FARRELL: YOUR HONOR, I'M BEEN REFERRED TO AS

PATIENT ZERO ON THE TRIAL TIME, SO I'M TRYING TO GET THROUGH IT HERE. I COULD USE AN ANTI-VIRAL.

DIRECT EXAMINATION

BY MR. FARRELL:

Q. DR. SEEGER, WHAT DO YOU DO FOR A LIVING?

A. I'M A VIROLOGIST.

Q. WHERE DO YOU PRACTICE AS A VIROLOGIST?

A. AT THE FOX CHASE CANCER CELL IN PHILADELPHIA, PENNSYLVANIA.

Q. AND YOU SAID YOU'RE A VIROLOGIST. IN SIMPLE TERMS, WHAT DOES THAT MEAN?

A. IT STUDIES HOW VIRUSES MULTIPLE MECHANISTICALLY, HOW THEY INTERACT WITH CELLS, HOW THEY CAUSE DISEASE, AND HOW THEY CAN BE TREATED WITH ANTI-VIRALS.

Q. AND WHAT VIRUSES DO YOU FOCUS OR STUDY ON?

A. MY FOCUS IS THE HEPATITIS B VIRUS, THE HEPATITIS C, AND WE ALSO STUDY THE WEST NILE VIRUS.

Q. NOW, YOU'RE WORKING AT THE FOX CHASE CANCER CENTER. WHY WOULD YOU BE STUDYING HEPATITIS B AND HEPATITIS C AT A CANCER CENTER?

A. THAT'S BECAUSE BOTH VIRUSES CAUSE LIVER CANCER IN PATIENTS THAT ARE CHRONICALLY INFECTED.

Q. NOW, DR. SEEGER, HAVE WE ASKED YOU TO COME TO COURT TODAY TO GIVE AN EXPERT OPINION ON WHETHER MERCK'S PATENTS DEMONSTRATE THAT THE COMPOUNDS IN THE CLAIM WORK, THAT THEY ARE

USEFUL TO COMBAT HEPATITIS C?

A. YES, YOU DID.

Q. AND HAVE WE ALSO ASKED YOU TO COME TO COURT TO PROVIDE AN EXPERT OPINION ON WHETHER A PERSON OF SKILL COULD USE THE COMPOUNDS THAT ARE ACTUALLY CLAIMED IN THE CLAIMS WITHOUT EXCESSIVE UNDUE EXPERIMENTATION?

A. YES, YOU DID.

Q. OKAY. NOW, BEFORE WE GET TO THOSE OPINIONS, I NEED TO GO THROUGH YOUR EDUCATION, TRAINING, AND EXPERIENCE THAT WOULD QUALIFY YOU TO GIVE THE OPINIONS. OKAY?

A. OKAY.

Q. I'M CALLING YOU DR. SEEGER. YOU HAVE A PH.D.?

A. THAT'S CORRECT.

Q. AND WHAT IS YOUR PH.D. IN?

A. IN RETRO VIRUSES AND USING RETRO VIRUSES AS VECTORS FOR GENE EXPRESSION.

Q. AND WHEN DID YOU RECEIVE YOUR PH.D.?

A. IN 1982.

Q. FROM WHERE?

A. FROM THE UNIVERSITY OF BASEL IN SWITZERLAND.

Q. THAT WOULD EXPLAIN THE ACCENT.

A. CORRECT.

Q. AND WHAT I'M GOING TO WANT US TO DO IS THAT WE'LL TALK SLOWLY AND LOUDLY SO THAT WE CAN KEEP UP WITH THE STUFF THAT YOU KNOW LIKE THE BACK OF YOUR HAND. OKAY?

A. ALL RIGHT.
Q. AFTER YOU RECEIVED YOUR PH.D., WHERE DID YOU DO YOUR POST-DOCTORAL FELLOWSHIP?
A. AT THE UNIVERSITY OF CALIFORNIA IN SAN FRANCISCO.
Q. AND WHAT WAS YOUR FOCUS OF RESEARCH AT UCSF?
A. HEPATITIS B VIRUS.
Q. HOW LONG DID YOU HAVE YOUR POST-DOCTORAL FELLOWSHIP AT UCSF?
A. FOUR YEARS.
Q. AND AFTER YOUR POST-DOCTORAL FELLOWSHIP, WHERE DID YOU GO?
A. I BECAME AN ASSISTANT PROFESSOR AT CORNELL UNIVERSITY IN ITHACA, NEW YORK.
Q. AND YOU WERE A PROFESSOR OF VIROLOGY; THAT IS CORRECT?
A. THAT'S CORRECT.
Q. AND HOW LONG DID YOU SERVE?
A. FOR FOUR YEARS.
Q. AND THEN YOU WENT TO THE FOX CHASE CANCER CENTER IN PHILADELPHIA?
A. YES.
Q. AND YOU'VE BEEN THERE FOR THE LAST 25 YEARS?
A. YES.
Q. AND WHAT HAS YOUR RESEARCH AT FOX CHASE FOCUSSED ON?
A. MOLECULAR BIOLOGY AND PATHOGEN NECESSARY OF HEPATITIS B VIRUS, HEPATITIS C VIRUS, AND TO SOME PART WEST NILE VIRUS.
Q. AND LET'S FOCUS ON HEPATITIS C.

DID YOU DEVELOP A CELL LINE TO REPLICATE THE HEPATITIS C AND WAS THAT CELL LINE THEN USED TO STUDY AND TEST NUCLEOTIDE COMPOUNDS?

A. YES.

Q. AND IN SIMPLE TERMS, CAN YOU DESCRIBE THAT CELL LINE?

A. WE DEVELOPED SEVERAL CELL LINES. WE PRODUCED THE ORIGINAL OBSERVATION THAT THIS VIRUS WOULD REPLICATE IN A HUMAN LIVER DERIVED CELL LINE; WE EXPANDED THIS TO MOUSE CELL LINES, AS WELL AS TO HUMAN CELL LINES THAT ARE NOT OF LIVER ORIGIN.

Q. NOW, DESCRIBE THE WORK THAT YOU'VE DONE WITH NUCLEOSIDE COMPOUNDS AND THE TESTING OF NUCLEOSIDES.

A. OUR FOCUS WAS ON UNDERSTANDING THE INTERFERON RESPONSE, AND FOR THAT PURPOSE WE HAVE USED NUCLEOSIDE ANALOGS TO EXPLORE THE MECHANISM, AND WE HAVE ALSO USED NUCLEOSIDE ANALOGS FOR OUR STUDIES ON THE HEPATITIS B VIRUS.

Q. NOW, HAS YOUR RESEARCH INVOLVED THE TESTING OF NUCLEOSIDE COMPOUNDS TO SEE IF THEY HAVE ACTIVITY AGAINST HEPATITIS C?

A. THAT'S CORRECT.

Q. AND HAS YOUR RESEARCH INVOLVED TESTING NUCLEOSIDE COMPOUNDS TO SEE IF THEIR TOXIC TO THE CELLS?

A. CERTAINLY.

Q. AND HAVE YOU PUBLISHED RESULTS OF THAT RESEARCH?

A. I DID.

Q. AND HOW OFTEN HAS YOUR VIROLOGY RESEARCH BEEN CITED OR RECOGNIZED BY OTHERS?

A. OVER 4,000 TIMES.

Q. AND FOR YOUR RESEARCH, DO YOU RECEIVE FUNDING FROM THE NATIONAL INSTITUTE OF HEALTH?

A. I HAVE RECEIVED FUNDING FOR THE LAST 30 YEARS.

Q. AND ARE YOU A NAMED INVENTOR ON PATENTS?

A. CORRECT.

Q. AND HOW MANY?

A. THREE.

Q. AND HAVE YOU ALSO HAD SCIENTIFIC INTERACTIONS WITH NUMEROUS PHARMACEUTICAL COMPANIES REGARDING HEPATITIS RESEARCH AND HEPATITIS C?

A. I DID.

Q. AND WHAT ORGANIZATIONS DO YOU BELONG TO THAT FOCUS ON VIROLOGY?

A. TO THE AMERICAN SOCIETY OF VIROLOGY, AND THE AMERICAN SOCIETY FOR MICRO BIOLOGY.

MR. FARRELL: YOUR HONOR, WE OFFER DR. SEEGER AS AN EXPERT IN VIROLOGY AND THE STUDY OF VIRUSES, INCLUDING HEPATITIS C, WITH A FOCUS ON MEASURING ACTIVITY AND TOXICITY OF NUCLEOSIDE COMPOUNDS.

THE COURT: WOULD YOU LIKE --

MR. FISHER: NO OBJECTION, YOUR HONOR.

THE COURT: ALL RIGHT. DR. SEEGER MAY TESTIFY AS DESIGNATED.

BY MR. FARRELL:

Q. DR. SEEGER, DO YOU HAVE AN EXPERT OPINION ABOUT WHETHER THE ASSERTED CLAIMS OF THE '499 AND THE '712 PATENTS ARE INVALID?

A. I DO.

Q. AND HAVE YOU PREPARED A DEMONSTRATIVE THAT SUMMARIZES THAT OPINION?

A. I DID.

Q. AND WITH THE COURT'S PERMISSION, WE WOULD PUT UP DEMONSTRATIVE PDX 501.

DO YOU HAVE PDX 501 IN FRONT OF YOU?

A. YES.

Q. AND SO WHAT ARE YOUR TWO OVERALL EXPERT OPINIONS?

A. SO CLAIMS 1 AND 2 OF THE '499 PATENT, AND CLAIMS 1 TO 3, 5, 7, AND 9 THROUGH 11 OF THE '712 ARE NOT ENABLED BECAUSE THE PATENTS DO NOT SHOW THAT THE CLAIMED COMPOUNDS ARE USEFUL.

AND, SECOND, CLAIMS 1 TO 2 OF THE '499 PATENT, AND CLAIMS 1, 2, 3, 5, AND 7 OF THE '712 PATENT ARE ALSO NOT ENABLED BECAUSE A PERSON OF ORDINARY SKILL COULD NOT USE THE COMPOUNDS WITHOUT UNDUE EXPERIMENTATION.

Q. SO YOU'RE SAYING THAT SEVEN OF THE TEN CLAIMS AT ISSUE ARE INVALID BECAUSE THEY REQUIRE EXCESSIVE EXPERIMENTATION?

A. THAT'S CORRECT.

Q. AND ALL TEN ARE INVALID BECAUSE THEY DO NOT SHOW ANY USEFULNESS?

A. THAT'S CORRECT.

Q. AND WHEN YOU SAY AND YOU USE THE TERM "USEFUL," WHAT DO YOU MEAN AS A VIROLOGIST WHEN WE'RE TALKING ABOUT NUCLEOSIDES AND HEPATITIS C?

A. THAT WOULD MEAN THAT I WOULD HAVE DATA THAT WOULD DEMONSTRATE AN ACTIVITY AGAINST THE VIRUS.

Q. IN SIMPLE TERMS, WHY DO THESE PATENTS NOT DISCLOSE A USE, A USEFULNESS OF THE COMPOUNDS CLAIMED IN THE CLAIMS?

A. BECAUSE THEY HAVE NO DATA CONCERNING THE CLAIMS IN THOSE PATENTS.

Q. OKAY. WHEN YOU SAY "NO DATA," HOW MUCH BIOLOGICAL DATA IS THERE FOR ANY COMPOUND ACTUALLY CLAIMED IN THE CLAIMS, FOR ANY ONE OF THEM?

A. THERE'S NONE.

Q. HOW MUCH DATA IS THERE FOR ANY COMPOUND THAT IS ACTUALLY CLAIMED IN THE CLAIMS DEALING WITH TOXICITY?

A. NONE.

Q. NOW, WHEN YOU SAY "NO DATA," LET'S HAVE A SCALE OF 0 TO 100, AND 100 IS EVERY POSSIBLE OF DATA THAT YOU CAN PUT IN COMPOUND, AND OBVIOUSLY 70, 50, OR 20 IS SOMEWHERE IN THE MIDDLE. FAIR?

A. FAIR.

Q. THESE MERCK PATENTS, WHERE DO THEY FALL ON THAT SCALE?

A. ZERO.

Q. AND WHY DO YOU NEED DATA, AT LEAST SOME DATA, ON THE COMPOUNDS ACTUALLY CLAIMED IN THE CLAIMS TO BELIEVE THAT THEY

ARE USEFUL?

A. BECAUSE WITHOUT DATA, I HAVE ABSOLUTELY NO GUIDANCE OR USE OR EVIDENCE FOR USEFULNESS.

Q. FOR THESE NUCLEOSIDE COMPOUNDS THAT ARE CLAIMED?

A. THAT'S CORRECT.

Q. WELL, HOW PREDICTABLE ARE NUCLEOSIDE COMPOUNDS?

A. THEY ARE UNPREDICTABLE.

Q. AND WHEN YOU SAY "UNPREDICTABLE," WHAT DO YOU MEAN?

A. WHAT I MEAN IS THAT THERE IS NO WAY IN 2002 OR TODAY TO PREDICT WHICH NUCLEOSIDE ANALOG WOULD WORK OR EXHIBIT TOXICITY OR WOULD BE RECOGNIZED BY THE CELL.

Q. AND WHAT WOULD IT TAKE FOR YOU TO KNOW THAT ANY PARTICULAR NUCLEOSIDE MIGHT BE ACTIVE AGAINST HEPATITIS C? WHAT WOULD YOU HAVE TO DO?

A. I WOULD NEED DATA. I WOULD NEED TO DO EXPERIMENTS.

Q. AND IF YOU NEED DATA, WHAT DO YOU HAVE TO DO TO GET DATA?

A. I HAVE TO DO AN EXPERIMENT THAT IS RELEVANT TO A PARTICULAR VIRUS, IN THIS CASE THE HEPATITIS C VIRUS.

Q. YOU'VE GOT TO TEST THEM; RIGHT?

A. I HAVE TO TEST THEM.

Q. OKAY. SO LET'S GO THROUGH THE ANALYSIS THAT YOU WENT THROUGH THAT LED YOU TO THOSE CONCLUSIONS. OKAY?

A. OKAY.

Q. FIRST AREA IS A PERSON OF ORDINARY SKILL IN THE ART, WELL KNOWN TO PATENT LAW, BUT LET'S GO WITH WHAT THAT MEANS.

YOU UNDERSTAND THAT YOU'RE SUPPOSED TO RENDER OPINIONS HERE FROM THE PERSPECTIVE OF A PERSON OF ORDINARY SKILL IN THE ART; IS THAT CORRECT?

A. THAT'S CORRECT.

Q. NOW, NOT TO PUT YOU ON THE SPOT, BUT YOU'RE A PERSON OF EXTRAORDINARY SKILL IN THE ART. FAIR?

A. FAIR.

Q. AND SO HOW WOULD YOU BE ABLE TO DO THAT?

A. WELL, DURING THE PAST 30 YEARS I HAVE TRAINED MANY PEOPLE IN THE LABORATORY, STUDENTS, POST-DOCTORAL FELLOWS, TECHNICIANS.

SO I BELIEVE I HAVE A VERY GOOD WAY OF DETERMINING WHAT WE CAN EXPECT FROM A PERSON OF ORDINARY SKILL.

Q. AND DID YOU FOLLOW A PARTICULAR DEFINITION OF A PERSON OF ORDINARY SKILL IN THIS CASE?

A. I THINK WE HAVE A DEFINITION, CORRECT.

Q. RIGHT. AND HAVE YOU PREPARED A DEMONSTRATIVE THAT PUTS ON THAT DEFINITION?

A. YOU HAVE --

Q. DO YOU HAVE A DEMONSTRATIVE THAT INCLUDES THAT DEFINITION?

A. YEAH.

Q. AND WITH THE COURT'S PERMISSION, COULD I PUT PDX-502 UP.

HERE'S MY FIRST PROMISE TO YOU, DR. SEEGER: I'M NOT GOING TO READ THAT. OKAY?

DID YOU FOLLOW THIS DEFINITION THAT IS ON PDX-502?

A. I DID.

Q. OKAY. BUT HERE'S WHAT I WANT TO GET TO IF I GET THROUGH ALL OF THOSE WORDS.

IT APPEARS THAT THE PERSON OF ORDINARY SKILL HERE IS A COMMITTEE OF PEOPLE; CLEAR?

A. THAT'S CORRECT.

Q. AND IT DOESN'T JUST INVOLVE VIROLOGISTS; IS THAT CORRECT?

A. YES.

Q. WHO ELSE IS INVOLVED?

A. WELL, YOU MIGHT HAVE A CHEMIST, YOU MIGHT HAVE A PHARMACOLOGIST, AND YOU MIGHT HAVE A PHYSICIAN.

AND SO IT'S A MULTIDISCIPLINARY TEAM.

Q. AND, FAIR, YOU'RE NOT A CHEMIST; RIGHT?

A. THAT'S CORRECT.

Q. AND YOU UNDERSTAND THAT THE CHEMIST IS COMING RIGHT AFTER YOU; RIGHT?

A. I DO.

Q. YOU UNDERSTAND THAT YOU'RE NOT A PHARMACOKINETIST OR PRODRUG EXPERT, BUT YOU KNOW THAT ONE OF THEM IS COMING AFTER THE CHEMIST; RIGHT?

A. I DO.

Q. OKAY. YOU CAN TAKE THAT DOWN. THANK YOU.

NOW, YOU ALSO HAD TO DO THIS FROM THE PERSON OF ORDINARY SKILL, OF ONE OF ORDINARY SKILL FROM A PARTICULAR TIMEFRAME; RIGHT?

A. CORRECT.

Q. AND WHAT WAS THE DATE THAT YOU WERE HAVING THE PERSON LOOKING AT THINGS?

A. WELL, THE TIMEFRAME IS 2002.

Q. JANUARY 18TH, 2002?

A. THAT'S CORRECT.

Q. AND THAT'S BECAUSE THAT'S THE DATE ON THE PATENT APPLICATION; CORRECT?

A. THAT'S CORRECT.

Q. OKAY. SO NOW WE KNOW THAT YOU'RE LOOKING AT A PERSON OF ORDINARY SKILL FROM JANUARY 18TH, 2002. I WANT TO TALK ABOUT WHAT THAT PERSON IS FACING AT THAT TIME. OKAY?

FOR A SCIENTIST OF ORDINARY SKILL WORKING IN JANUARY OF 2002, WHAT CHALLENGES DOES THAT PERSON FACE TRYING TO FIND A NUCLEOSIDE COMPOUND THAT WILL BE USEFUL AGAINST HEPATITIS C?

A. THE CHALLENGES ARE ENORMOUS AT THE TIME, AND STILL TODAY, FOR A VARIETY OF REASONS, SOME HAVE ALREADY BEEN DISCUSSED HERE.

BRIEFLY, THERE ARE BILLIONS OF POSSIBILITIES. THERE ARE ISSUES IN TERMS OF RECOGNITION OF THOSE BUILDING -- BUILDING BLOCKS BY THE CELL. THEY GO IN AND ARE THEY CAN USED BY THE CELL? METABOLIZED BY THE CELL?

AND THEN WE HAVE THE ENORMOUS ISSUE OF TOXICITY. MANY OF THOSE COMPOUNDS KILL CELLS. AS A MATTER OF FACT, THAT'S HOW THE FIELD STARTED, WITH TRYING TO FIND CANCER DRUGS THAT KILL

CELLS.

THEN NEXT WE HAVE THE CHALLENGE THEN TO FIND A COMPOUND THAT IS SPECIFIC FOR THIS ONE POLYMERASE, AND IN THIS CASE THE HEPATITIS C VIRUS, LEAVING THE OTHER 20 POLYMERASES OR SO IN THE CELL ALONE, NOT INTERFERING WITH ANY OTHER STEPS THAT ARE VITAL FOR LIFE, AND ULTIMATELY WE HAVE TO HAVE THE SPECIFICITY FOR THE PARTICULAR VIRUS.

Q. OKAY. SO WHY IS IT SO HARD TO FIND -- IN 2002 -- TO FIND A NUCLEOSIDE COMPOUND THAT WILL INTERRUPT OR MESS WITH THE HEPATITIS C RNA AND LEAVE ALONE THE RNA OF ALL OF THE OTHER GOOD PARTS OF THE CELL? WHY IS THAT SO HARD?

A. WELL, FOR JUST THE REASONS THAT I EXPLAINED, BECAUSE THERE ARE -- THE PITFALLS ARE JUST ENORMOUS.

Q. AND IS THAT STILL HARD EVEN TODAY?

A. ABSOLUTELY.

Q. SO WHY -- WHAT IS THE ULTIMATE GOAL OF FINDING A USEFUL NUCLEOSIDE? WHAT WOULD A USEFUL NUCLEOSIDE HAVE TO DO?

A. SO IN THIS CASE OF COURSE IT WOULD HAVE BEEN A NUCLEOSIDE THAT HONES INTO THE LIVER, INHIBITS THE VIRUS, BUT DOES NOT INTERFERE WITH THE NORMAL FUNCTION OF THE CELL.

Q. I'VE HEARD THE PHRASE, "THE DISEASE IS THE VIRUS. THE PATIENT IS THE CELL."

IS THAT A FAIR DESCRIPTION?

A. THAT'S FAIR.

Q. AND YOU WANT TO KILL THE VIRUS AND NOT THE PATIENT?

A. THAT'S CORRECT.

Q. HOW LONG HAVE SCIENTISTS WORKED WITH NUCLEOSIDE COMPOUNDS TO COMBAT ANY KIND OF DISEASE?

A. 50 TO 60 YEARS.

Q. AND WHAT WAS IT PRIMARILY ORIGINALLY THOUGHT TO BE USED FOR, NUCLEOSIDE COMPOUNDS, TO FIGHT WHAT?

A. FOR CANCER, ANTI-CANCER DRUGS.

Q. AND WITH CANCER, WHAT DO YOU WANT TO DO WITH THOSE?

A. YOU WANT TO KILL THE CELL AND NOT THE PATIENT.

Q. DO YOU NEED TO THREAD THE NEEDLE THERE OF KILLING THE VIRUS AND NOT THE CELL?

A. THAT'S RIGHT.

Q. AND SO HOW PREDICTABLE ARE THE EFFECTS OF MAKING SMALL CHANGES IN NUCLEOSIDE IN 2002 IN TERMS OF WHETHER IT STAYS ACTIVE OR BECOMES TOXIC?

A. THERE'S NO PREDICTABILITY. YOU HAVE TO DO AN EXPERIMENT.

Q. WELL, WHAT ABOUT TODAY, YOU KNOW, 14 YEARS LATER?

A. WELL, TRUE. SAME FACTS ARE TRUE.

Q. SO NOW WE KNOW THE CHALLENGE FACED BY A PERSON OF ORDINARY SKILL. WE KNOW THE CHALLENGE THAT IS FACING A PERSON OF ORDINARY SKILL AND THE PERSPECTIVE THEY HAVE.

AND I WANT TO TALK ABOUT THE FIELD AND THE CHALLENGE IN HEPATITIS C. OKAY?

A. OKAY.

Q. AND WE'VE BEEN TOLD THAT HEPATITIS C WAS IDENTIFIED AS A

DISEASE IN 1992; CORRECT?

A. THAT'S CORRECT.

Q. AND SO BY 2002, THERE HAD BEEN 13 YEARS OF INTENSE RESEARCH ON HEPATITIS C AND NUCLEOSIDE COMPOUNDS TO COMBAT IT?

A. THE ANSWER IS NO.

Q. OKAY. WELL, WHY? WHAT IS THE HOLD UP?

A. THE FIELD GOT A SLOW START BECAUSE METHODS TO LOOK AT NUCLEOSIDE ANALOGS HAVE ONLY BEEN DEVELOPED IN THE LATE '90S.

Q. OKAY. AND ARE THESE, THESE THINGS THAT WE HAVE ALL HEARD AS ASSAYS OR TESTS?

A. THEY'RE ASSAYS.

Q. AND WHAT ARE THE PARTICULAR KINDS OF TESTS OR ASSAYS THAT WERE DEVELOPED IN THE LATE 1990S THAT ENABLED SCIENTISTS TO BEGIN TO EVALUATE NUCLEOSIDE COMPOUNDS?

A. IT WAS 1997 WHEN THE POLYMERASE OF THE HEPATITIS C WAS EXPRESSED IN AN ENZYMATICALLY ACTIVE FORM IN VITRO, THAT MEANS OUTSIDE OF THE CELL SEPARATE.

AND IT WAS IN 1999 THAT THE CELL BASED ASSAY WE HAVE HEARD HERE, THE SO-CALLED REPLICON ASSAY, WAS PUBLISHED.

Q. SO A PERSON OF ORDINARY SKILL IN 2002 FACES THE CHALLENGE THAT YOU HAVE TALKED ABOUT IN A RELATIVELY NEW FIELD TO TRY TO FIND A USEFUL NUCLEOSIDE COMPOUND.

TO GIVE AN IDEA OF THE OPTIONS FACING THAT PERSON OF ORDINARY SKILL, HOW MANY NUCLEOSIDE COMPOUNDS ARE THERE?

A. WELL, THERE ARE BILLIONS.

Q. ALL RIGHT. SO WITH THAT BACKGROUND, LET'S TURN TO THE MERCK PATENTS IN THIS CASE. ALL RIGHT?

A. OKAY.

Q. YOU HAVE IN FRONT OF YOU YOUR EXHIBIT BINDER. IF YOU CAN TURN TO EXHIBIT 1 IN YOUR BINDER, WHICH IS I THINK ALREADY IN EVIDENCE.

THAT IS THE MERCK '499 PATENT; CORRECT?

A. CORRECT.

Q. IF YOU COULD TURN TO EXHIBIT 2 IN YOUR BINDER.

CAN YOU TURN TO EXHIBIT 2. THAT IS THE MERCK '712 PATENT; CORRECT?

A. THAT'S CORRECT.

MR. FARRELL: AND IF THIS IS NOT IN EVIDENCE ALREADY, I WOULD MOVE EXHIBIT 2 INTO EVIDENCE.

THE COURT: I DON'T THINK IT'S IN EVIDENCE. NO OBJECTION?

MR. FISHER: NO OBJECTION, YOUR HONOR.

THE COURT: EXHIBIT 2 WILL BE ADMITTED.

(PLAINTIFF'S EXHIBIT 2 WAS RECEIVED IN EVIDENCE.)

BY MR. FARRELL:

Q. NOW, EXHIBIT 1 AND EXHIBIT 2, THE '499 AND '712 PATENTS, THESE ARE THE TWO PATENTS YOU ANALYZED; IS THAT CORRECT?

A. THAT'S CORRECT.

Q. NOW, WHILE THE CLAIMS OF THE TWO PATENTS HAVE DIFFERENCES, WHAT ABOUT THE BODY OF THE TWO PATENTS, WHAT WE HAVE BEEN

CALLING THE SPECIFICATIONS?

A. THEY'RE VERY SIMILAR.

Q. AND FOR PURPOSES OF YOUR ANALYSIS, DID YOU TREAT THESE TWO SPECIFICATIONS AS THE SAME?

A. I DID.

Q. AND SO WHEN YOU LOOKED AT THESE PATENTS, WHEN YOU BEGAN TO ANALYZE THESE PATENTS AND THE CLAIMS AND THE COMPOUNDS THAT ARE ACTUALLY CLAIMED IN THE CLAIMS, WHAT FIRST JUMPED OUT AT YOU?

A. WHAT JUMPED OUT AT ME WAS THE FACT THAT THERE WAS NO DATA COVERING THE CLAIMS.

Q. NOW, I WANT TO MAKE SURE. YOU MEAN THAT FOR THE CLAIMS -- THE COMPOUNDS THAT ARE ACTUALLY IN THE CLAIMS THAT ARE AT ISSUE, THERE WAS NO DATA OF ANY SORT?

A. THERE IS NO DATA OF ANY SORT.

Q. OKAY. AND YOU WERE IN COURT WHEN THE COURT JUST READ THE STIPULATED FACT ABOUT NO TESTING OF THOSE?

A. I WAS IN THE COURT.

Q. SO THERE WAS NO DATA BECAUSE AS OF JANUARY 13TH, 2002, MERCK HADN'T TESTED ONE OF THESE COMPOUNDS THAT ARE ACTUALLY CLAIMED IN THE CLAIMS; RIGHT?

A. THAT'S RIGHT.

Q. OKAY. SO THIS LACK OF ANY DATA FOR ANY OF THE COMPOUNDS ACTUALLY CLAIMED IN THE CLAIMS, WHY DOES THIS MEAN TO YOU AS AN EXPERT THAT YOU CAN'T TELL THAT THE CLAIM COMPOUNDS ARE USEFUL?

A. WELL, IF I HAVE NO DATA, AGAIN, I HAVE NO GUIDANCE. I

HAVE NO INFORMATION AND I HAVE NO REASON TO MOVE ON.

Q. AND WHY NOT?

A. BECAUSE, AGAIN, I HAVE NO DATA. THERE'S ZERO DATA.

Q. AND YOU NEED SOME DATA BECAUSE OF WHY?

A. I NEED -- I NEED DATA THAT PROVIDES ME WITH INFORMATION THAT MAKES ME BELIEVE THAT THERE MIGHT BE SOMETHING USEFUL HERE.

Q. AND IS IT BECAUSE THEY'RE SO UNPREDICTABLE?

A. THAT'S ABSOLUTELY TRUE.

Q. OKAY. WELL, I WANT TO GO TO A PHRASE THAT IS IN THE MERCK SPECIFICATION, OKAY. I THINK THE PHRASE IS REPRESENTATIVE COMPOUNDS, OKAY?

SO IF YOU CAN GO TO EXHIBIT 1 IN YOUR BINDER, WHICH IS THE '499 PATENT, AND TURN TO WHAT IS CALLED COLUMN 132.

OKAY. WHEN YOU GET THERE, WE'RE LOOKING AT LINES 55 TO 56. OKAY? DO YOU SEE THAT?

A. I DO.

Q. OKAY. AND THIS -- I WANT TO JUST READ THIS ONE SENTENCE THAT INVOLVES THIS PHRASE. IT SAYS HERE, "REPRESENTATIVE COMPOUNDS TESTED IN THE HCV NS5B POLYMERASE ASSAY EXHIBITED IC 50'S LESS THAN 100 MICROMOLAR."

THAT IS REFERRING, ISN'T IT, TO SOME SORT OF TESTING IN AN ASSAY; RIGHT?

A. CORRECT.

Q. OKAY. WELL, DOESN'T THAT PROVIDE YOU SOME DATA FOR THE

COMPOUNDS THAT ARE IN THE CLAIMS?

A. NO, BECAUSE THE REPRESENTATIVE COMPOUNDS ARE NOT COVERED BY THE CLAIMS.

Q. SO WHAT IS CALLED THE REPRESENTATIVE COMPOUNDS, THOSE ALSO AREN'T COMPOUNDS THAT ARE IN ANY OF THE CLAIMS?

A. THAT'S CORRECT.

Q. OKAY. WELL, IN YOUR EXPERT OPINION, CAN YOU -- DOES THE PHRASE "REPRESENTATIVE COMPOUND" MEAN THAT YOU CAN RELY ON IT WHEN, IN FACT, IT'S NOT A COMPOUND INCLUDED IN THE CLAIM?

A. I CANNOT.

Q. WELL, THIS JURY IS -- I MEAN, I THINK THEY'VE BEEN TOLD THAT THESE ARE REALLY BIG PATENTS. I THINK THAT'S WHAT I HEARD.

I THINK, DOCTOR, I WAS JUST TOLD THAT THERE WAS 146 EXAMPLES. THERE'S 154 EXAMPLES IN HERE; CORRECT?

A. THAT'S CORRECT.

Q. AND THEY HAVE, LIKE, CHEMICAL STRUCTURES; RIGHT?

A. THEY DO.

Q. AND -- AND -- WELL, OF THOSE 154 EXAMPLES, HOW MANY OF THEM ARE ACTUALLY COMPOUNDS THAT ARE INCLUDED IN THE CLAIMS?

A. NONE.

Q. NOT A ONE?

A. ZERO.

Q. AND HOW DO YOU KNOW THAT?

A. WELL, THAT INFORMATION WAS TRANSMITTED TO ME BY THE

CHEMIST, DR. SECRIST.

Q. AND ALSO YOU JUST HEARD THE COURT READ THE SAME STIPULATION --

A. THAT'S CORRECT.

Q. -- TO THE JURY?

OKAY. SO WHAT CAN YOU TELL, IF ANYTHING, ABOUT THE COMPOUNDS THAT ARE CLAIMED IN THE CLAIMS FROM THE 154 EXAMPLES IN THE BODY OF THE PATENT?

A. I CAN'T SAY ANYTHING.

Q. AND, A DUMB QUESTION, BUT WHY NOT?

A. BECAUSE THEY'RE NOT THE SAME.

Q. NOW, I KNOW YOU'VE TOLD US THAT NONE OF THE EXAMPLES ARE COMPOUNDS IN THE CLAIMS. I JUST WANT TO TALK ABOUT, I HOPE, A COUPLE OF THEM. OKAY?

A. OKAY.

Q. AND SO YOU WERE HERE FOR OPENING STATEMENTS; CORRECT?

A. I WAS.

Q. AND THE JURY WAS SHOWN A SLIDE THAT SHOWED THREE OF THE PATENT EXAMPLES?

A. YES.

Q. AND CAN WE HAVE CALLED BACK UP, MR. ANG, DDX-016 FROM MERCK'S OPENING STATEMENT.

THIS WAS THE SLIDE THAT THE JURY SAW.

DO YOU RECALL THIS, DR. SEEGER?

A. I DO.

Q. AND IT SHOWED EXAMPLE 134, 143, AND 145 FROM THE SPECIFICATION OF THE MERCK PATENT?

A. THAT'S RIGHT.

Q. NOW, NONE OF THESE ARE COMPOUNDS THAT ARE ACTUALLY CLAIMED; CORRECT?

A. THAT'S CORRECT.

Q. BUT I WANT TO FOCUS ON EXAMPLE 143 AND 145 AND SEE WHAT WE ACTUALLY DO KNOW. OKAY?

A. OKAY.

Q. AND SO CAN YOU TURN TO EXHIBIT 168 IN YOUR BINDER.

WHAT IS EXHIBIT 168?

A. 168 IS AN ISIS REPORT FROM THE NUCLEOSIDE PROGRAM OF THE ISIS IRBM CORPORATION.

Q. SO THIS IS AN INTERNAL ISIS DOCUMENT; CORRECT?

A. YES.

Q. IT BEARS A DATE OF SEPTEMBER 26TH, 2001; CORRECT?

A. CORRECT.

Q. BEFORE THE PATENT APPLICATION WAS FILED; CORRECT?

A. THAT'S CORRECT.

MR. FARRELL: MOVE EXHIBIT 168 INTO EVIDENCE, YOUR HONOR.

MR. FISHER: NO OBJECTION, YOUR HONOR.

THE COURT: IT WILL BE ADMITTED.

(PLAINTIFF'S EXHIBIT 168 WAS RECEIVED IN EVIDENCE.)

BY MR. FARRELL:

Q. SO NOW LET'S SEE IF I CAN DO THIS RIGHT. IF YOU LOOK AT EXHIBIT 168, PAGE 0002. OKAY. I HAVE IT UP ON THE SCREEN. OKAY. AND IF YOU COULD SEE THE COMPOUND LABELLED L-393942.

THIS IS EXAMPLE 143 THAT WAS SHOWN TO THE JURY; CORRECT?

A. THAT'S CORRECT.

Q. AND WHAT DOES MERCK'S OWN DOCUMENT SAY IN SEPTEMBER OF 2001 ABOUT EXAMPLE 143?

A. NOT ACTIVE AT 50 MICROMOLAR.

Q. ARE YOU USEFUL IF YOU'RE NOT ACTIVE?

A. I DON'T THINK SO.

Q. OKAY. NOW, SAME PAGE. CAN YOU LOOK AT COMPOUND L-393938.

A. YES.

Q. NOW, THAT'S THE EXAMPLE 145 THAT THE JURY WAS SHOWN IN OPENING; CORRECT?

A. CORRECT.

Q. HOW DOES MERCK SAY THAT ONE IS DOING IN SEPTEMBER OF 2001?

A. NOT ACTIVE.

Q. BUT THOSE ARE EXAMPLES IN THEIR PATENT; CORRECT?

A. THAT'S CORRECT.

Q. FILED IN JANUARY OF 2002; CORRECT?

A. THAT'S CORRECT.

Q. ALL RIGHT. THANK YOU, SIR.

NOW, BUT I WANT TO GO BACK TO THIS ISSUE ABOUT NO TESTING, NO DATA. OKAY?

A. OKAY.

Q. THE JURY HAS JUST HEARD THAT MERCK DID NOT DO ANY TESTING OF THE COMPOUNDS THAT THEY ACTUALLY CLAIM IN THE PATENTS BY THE TIME THAT THEY HAD FILED THEIR PATENT APPLICATION IN JANUARY OF 2002; CORRECT?

A. THAT'S CORRECT.

Q. BUT MERCK AT SOME POINT DID DO TESTING OF SOME OF THESE COMPOUNDS; RIGHT?

A. YES.

Q. AND WHEN DID THEY ACTUALLY GET AROUND TO TESTING COMPOUNDS THAT ARE ACTUALLY CLAIMED IN THE PATENTS?

A. I BELIEVE IT WAS AROUND 2005.

Q. AUGUST OF 2005; CORRECT?

A. CORRECT.

Q. AND HOW DO YOU KNOW THAT?

A. I WAS SHOWN DOCUMENTS TO THAT EFFECT.

Q. AND WHEN YOU SAY "DOCUMENTS," THIS WAS A LONG SPREADSHEET OF THOUSANDS OF PAGES; RIGHT?

A. THAT'S CORRECT.

Q. AS FAR AS YOU KNOW, THAT'S THE FIRST TIME THAT MERCK GOT AROUND TO ACTUALLY TESTING ANY OF THE COMPOUNDS IN THE CLAIMS THAT THEY FILED IN JANUARY OF 2002; CORRECT?

A. THAT'S CORRECT.

Q. ALL RIGHT. SO LET ME TURN TO YOUR SECOND OPINION, THE UNDUE EXPERIMENTATION OR EXCESSIVE EXPERIMENTATION. OKAY?

FOR SEVEN OF THE CLAIMS, CLAIMS 1 AND 2 OF THE '499 PATENT

AND CLAIMS 1 THROUGH 3, 5 AND 7 OF THE '712 PATENT, DO YOU HAVE AN EXPERT OPINION AS TO WHETHER A PERSON OF ORDINARY SKILL COULD NOT USE THE COMPOUNDS CLAIMED BECAUSE OF THE ADDITIONAL REASON OF EXCESSIVE OR UNDUE EXPERIMENTATION?

A. I DO HAVE AN OPINION.

Q. NOW, WHAT IS YOUR EXPERT OPINION AS TO WHETHER A PERSON OF ORDINARY SKILL COULD USE THE NUCLEOSIDE COMPOUNDS CLAIMED IN THOSE SEVEN CLAIMS WITHOUT EXCESSIVE EXPERIMENTATION?

A. MY OPINION IS THAT IT'S IMPOSSIBLE TO DO THAT WITH -- AND YOU -- OKAY. LET ME BACKTRACK.

THE CHALLENGE TO SCREEN THOSE WOULD BE ENORMOUS.

Q. WHY WOULD IT BE HARD TO SCREEN, IN 2002, A MILLION OR MORE NUCLEOSIDE COMPOUNDS?

A. WELL, THERE ARE NO SCREENS AVAILABLE AT THAT TIME, AND MAYBE EVEN TODAY TO SCREEN SUCH ENORMOUS NUMBERS OF COMPOUNDS.

Q. WELL, HOW LONG WOULD IT TAKE A PERSON OF ORDINARY SKILL IN JANUARY OF 2002 TO TEST A MILLION OR MORE NUCLEOSIDE COMPOUNDS FOR ACTIVITY AND TOXICITY?

A. IF THEY WERE AVAILABLE, YEARS.

Q. NOW, WHEN DID HIGH THROUGHPUT SCREENS WHERE YOU COULD SCREEN MANY NUCLEOSIDE COMPOUNDS, WHEN DID THOSE COME ABOUT?

A. THE PUBLICATIONS WERE 2004 AND 2005.

Q. AND IF -- EXCUSE ME.

AND IF YOU LOOK AT EXHIBIT 2172 IN YOUR BINDER, I THINK IT'S CALLED THE ZUCK ARTICLE. DO YOU HAVE THAT?

A. CORRECT.
Q. IS THIS AN ARTICLE PUBLISHED IN 2004 ANNOUNCING HIGH THROUGHPUT SCREENING?
A. THAT'S CORRECT.
MR. FARRELL: MOVE EXHIBIT 2172 INTO EVIDENCE.
MR. FISHER: NO OBJECTION.
THE COURT: IT WILL BE ADMITTED.
(PLAINTIFF'S EXHIBIT 2172 WAS RECEIVED IN EVIDENCE.)
BY MR. FARRELL:
Q. AND WHILE YOU'RE STILL THERE, LOOK AT THE 2173, WHAT'S CALLED THE O'BOYLE ARTICLE. DO YOU SEE THAT?
A. YES.
Q. AND THAT HAS A 2004 DATE --
A. ACTUALLY PUBLISHED IN 2005.
Q. RIGHT. BUT IT BEARS A FIRST DATE OF 2004 TO BE FAIR?
A. ALL RIGHT.
Q. AND THAT ALSO IS ANNOUNCES HIGH THROUGHPUT SCREEN?
A. THAT'S CORRECT.
Q. AND IN 2002, WERE HIGH THROUGHPUT SCREENS AVAILABLE FOR NUCLEOSIDE COMPOUNDS?
A. THERE'S NO HIGH THROUGHPUT AVAILABLE BASED ON PUBLICATIONS.
Q. SO I DO WANT TO ACTUALLY -- WELL, LET'S LEAVE ASIDE THE EXCESSIVE EXPERIMENTATION FOR THE SEVEN CLAIMS. OKAY?
I'LL TRY IT AGAIN. LET'S LEAVE ASIDE THIS ISSUE OF

EXCESSIVE EXPERIMENTATION FOR THE SEVEN CLAIMS.

FOR ALL TEN CLAIMS, DO ALL OF THEM SUFFER FROM THIS LACK OF ANY DATA FOR ANY OF THE COMPOUNDS CLAIMED?

A. ALL OF THEM.

Q. OKAY. BUT, NOW, THREE OF THE CLAIMS INVOLVE, LIKE, 144 COMPOUNDS, 72 AND 72 COMPOUNDS; RIGHT?

A. CORRECT.

Q. AND SO WHY ISN'T THAT USEFUL?

A. BECAUSE THERE IS NO DATA FOR THOSE CLAIMS EITHER.

Q. SO DO YOU HAVE ANY CLUE, ANY INDICATION AT ALL THAT THEY HAVE ANY USE FOR FIGHTING HEPATITIS C?

A. NO, I DO NOT.

Q. WHAT, AGAIN, WOULD YOU WANT TO SEE IN A PATENT TO SAY THAT THERE'S SOME USEFULNESS HERE FOR COMBATTING HEPATITIS C?

A. I WOULD WANT TO SEE SOME DATA FROM TESTING THAT THE COMPOUND HAS AN ACTIVITY AGAINST HEPATITIS C VIRUS.

Q. WOULD YOU LIKE TO SEE THAT THEY'RE MAKING, USING, AND TESTING THEM IN THEIR LAB?

A. EXACTLY.

Q. WELL, I WANT TO TURN TO A SENTENCE THAT IS IN THE PATENTS THAT I THINK WAS READ TO THE JURY IN OPENING STATEMENT.

CAN YOU TURN TO -- I THINK EXHIBIT 2, THE '712 PATENT. I THINK IT'S IN BOTH, BUT LET'S GO TO THAT. IT'S IN THE ABSTRACT.

ALL RIGHT. AND I'M GOING TO READ THIS SENTENCE, IF I CAN,

AS WE GO. "THE PRESENT INVENTION PROVIDES NUCLEOSIDE COMPOUNDS AND CERTAIN DERIVATIVES THEREOF WHICH ARE INHIBITORS OF RNA-DEPENDENT RNA VIRAL POLYMERASE. THESE COMPOUNDS ARE INHIBITORS OF RNA-DEPENDENT RNA VIRAL REPLICATION AND ARE USEFUL FOR THE TREATMENT OF RNA-DEPENDENT RNA VIRAL INFECTION. THEY ARE PARTICULARLY USEFUL AS INHIBITORS OF HEPATITIS C VIRUS (HCV) NS5B POLYMERASE, AS INHIBITORS OF HCV REPLICATION, AND/OR FOR THE TREATMENT OF HEPATITIS C INFECTION."

RIGHT?

A. RIGHT.

Q. SO THE PATENT SAYS THEY'RE USEFUL; RIGHT?

A. WELL --

Q. LET ME ASK YOU, THE PATENT SAYS THEY'RE USEFUL?

A. YES.

Q. THE LAWYER WROTE THIS UP AND WROTE THAT THEY'RE USEFUL?

A. YES.

Q. AND AS A SCIENTIST, DO YOU JUST TAKE THAT STATEMENT? IS THAT GOOD ENOUGH FOR YOU?

A. WITHOUT DATA, I CANNOT SEE HOW THIS STATEMENT CAN BE SUPPORTED.

Q. WELL, WHY WOULD A PERSON OF ORDINARY SKILL, IN JANUARY OF 2002, NOT TAKE THAT STATEMENT AT FACE VALUE? WHY WOULD A SCIENTIST NOT TAKE THAT STATEMENT AT FACE VALUE?

A. AGAIN, BECAUSE OF THE UNPREDICTABILITY OF THIS WHOLE FIELD AND, AGAIN, BECAUSE THERE'S REALLY NO DATA THAT SUPPORTS THIS

STATEMENT.

Q. SO WHILE YOU COULD MAYBE TEST THE 72 OR THE OTHER 72 OR THE 144 IN THOSE OTHER THREE CLAIMS, WOULD YOU EVER WANT TO?

A. NO.

Q. AND WHAT WOULD YOU NEED, IN ONE WORD, WHAT DO YOU NEED TO KNOW THAT THERE'S A USEFULNESS FOR FIGHTING HEPATITIS C?

A. DATA.

MR. FARRELL: NO MORE QUESTIONS, YOUR HONOR.

THE COURT: ALL RIGHT. WHILE WE HAVE A BREAK, I DON'T HAVE REALTIME.

MR. FISHER: I'M SORRY.

THE COURT: I DON'T HAVE MY REALTIME. I DON'T KNOW WHEN IT WENT OFF.

SO SINCE WE'RE AT A LITTLE BREAK, LET'S SEE IF WE CAN, WITHOUT TAKING A BREAK, JUST SPEND A MINUTE.

AND IF I CAN ASK PEOPLE IF ANY CELL PHONES ARE TURNED ON, TO TURN THEM OFF. WE SEEM TO BE HAVING FEW PROBLEMS.

(RECESS FROM 3:43 P.M. UNTIL 3:45 P.M.)

THE COURT: ALL RIGHT. WHY DON'T YOU GO AHEAD?

CROSS-EXAMINATION

BY MR. FISHER:

Q. GOOD AFTERNOON, DR. SEEGER. I'M STAN FISHER. I HAVEN'T HAD THE OPPORTUNITY TO INTRODUCE MYSELF.

A. GOOD AFTERNOON.

Q. SIR, YOU'VE BEEN DOING RESEARCH FOR A WHILE; IS THAT

RIGHT, SIR?

A. THAT'S CORRECT.

Q. SINCE THE LATE 1970S?

A. THAT'S CORRECT.

Q. AND YOU'VE HEARD OF MERCK BEFORE YOU GOT INVOLVED IN THIS CASE; RIGHT?

A. OH, YEAH.

Q. AND MERCK'S BEEN AROUND SINCE YOU STARTED DOING YOUR RESEARCH?

A. MOST LIKELY, YES.

Q. AND IT HAS A SUCCESSFUL HISTORY IN THE ANTI-INFECTIVE SPACE?

A. THAT'S CORRECT.

Q. AND THERE'S NO REASON TO DOUBT THAT WHEN MERCK FILED ITS PATENT APPLICATIONS IN JANUARY OF 2002 THAT IT BELIEVED THAT THE MERCK/ISIS COLLABORATION HAD BEEN SUCCESSFUL?

A. I DON'T KNOW.

Q. YOU DON'T HAVE ANY REASON TO DOUBT THAT, DO YOU?

A. I JUST DON'T KNOW.

Q. AND HAVE YOU REVIEWED ANY OF THE DOCUMENTS FROM THE COLLABORATION CONTEMPORANEOUS WITH THE FILING OF MERCK'S PATENT APPLICATION?

A. I HAVE SEEN MANY DOCUMENTS. I DON'T KNOW EXACTLY WHAT YOU'RE REFERRING TO NOW.

Q. OKAY. BUT YOU DON'T KNOW ONE WAY OR ANOTHER WHETHER MERCK

AND ISIS HAD BELIEVED THE COLLABORATION TO BE A SUCCESS WHEN THEY FILED THEIR PATENT APPLICATION?

A. I HAVE NO INFORMATION ABOUT WHAT THEY BELIEVED.

Q. OKAY. LET'S GO TO EXHIBIT 1, THE '499 PATENT. AND I KNOW THAT MR. FARRELL WALKED YOU THROUGH SOME OF IT?

A. YEAH.

Q. AND DO YOU HAVE IT THERE IN FRONT OF YOU?

A. I DO.

Q. IT WOULD ALSO BE UP ON THE SCREEN.

A. OKAY.

Q. SO YOU CAN FOLLOW ALONG ON THE SCREEN AS WELL.

NOW, I KNOW MR. FARRELL WENT THROUGH A LITTLE BIT OF THIS AND I WANT TO DOUBLE BACK TO A COUPLE OF THINGS.

SO IN COLUMN 2 OF THE PATENT, IF WE GO THERE, MR. SCHLIESSKE.

THE PATENT STATES THAT THE COMPOUNDS OF THE PRESENT INVENTION IN CERTAIN DERIVATIVES ARE POTENT INHIBITORS OF RNA-DEPENDENT RNA VIRAL REPLICATION, AND IN PARTICULAR HCV REPLICATION.

DO YOU SEE THAT?

A. I SEE THAT.

Q. AND IT SAYS THAT; RIGHT?

A. THAT'S WHAT IT STATES.

Q. AND THEN IT STATES THAT THE 5' TRIPHOSPHATE DERIVATIVES OF THE NUCLEOSIDE COMPOUNDS ARE INHIBITORS OF RNA-DEPENDENT, RNA

VIRAL POLYMERASE, AND IN PARTICULAR HCV NS5B POLYMERASE.

DO YOU SEE THAT?

A. I SEE THAT.

Q. AND THEN IT GOES ON TO STATE THAT THE INSTANT NUCLEOSIDE COMPOUNDS AND DERIVATIVES THEREOF ARE USEFUL TO TREAT RNA-DEPENDENT RNA VIRAL INFECTION, AND IN PARTICULAR HCV INFECTION.

DID I READ THAT RIGHT?

A. YOU DID.

Q. AND SO WE'RE IN AGREEMENT, AND I BELIEVE YOU TESTIFIED TO THIS IN YOUR DIRECT, THAT THE PATENTS STATE THAT THE COMPOUNDS OF THE INVENTION WERE USEFUL FOR HEPATITIS C; RIGHT?

A. I CANNOT AGREE WITH YOUR STATEMENT.

Q. THAT THEY DON'T -- THAT DOESN'T STATE THAT THEY'RE USEFUL?

A. WELL, YOU JUST READ SENTENCES, BUT THE INTERPRETATION -- I DISAGREE WITH THE INTERPRETATION.

Q. OKAY. I MEAN, THAT'S FAIR.

YOU AGREE THAT IT DOESN'T DISCLOSE A USE, BUT IT SAYS THAT THE INSTANT COMPOUNDS ARE USEFUL.

I DIDN'T READ THAT WRONG, DID I?

A. YOU DIDN'T READ IT WRONG.

Q. OKAY. AND THAT'S THE SAME FOR EXHIBIT 2, THE '712 PATENT; RIGHT?

A. I BELIEVE SO.

Q. OKAY. AND IT ALSO STATES, MERCK'S PATENTS, THAT THE

COMPOUNDS OF THE INVENTIONS WERE USEFUL AS INHIBITORS OF NS5B POLYMERASE; ISN'T THAT RIGHT?

A. UM.

Q. IT'S THE SENTENCE BEFORE --

A. THE SENTENCE BEFORE, YOU READ THE SENTENCE CORRECTLY.

Q. OKAY. IT STATES THAT THE PATENTS ARE USEFUL AS INHIBITORS OF NS5B POLYMERASE; RIGHT?

A. USEFUL. I DISAGREE IT WAS USEFUL BECAUSE, AGAIN, THERE'S NO DATA IN THE PATENTS, SO I STICK WITH JUST THE SENTENCES AS THEY ARE WRITTEN.

Q. OKAY. IT SAYS THAT THEY ARE INHIBITORS OF RNA-DEPENDENT VIRAL POLYMERASE; RIGHT?

A. IT SAYS THE TRIPHOSPHATES DERIVATIVES, YEAH, ARE INHIBITORS, YEP.

Q. AND THAT'S WHAT THE PATENTS STATE?

A. THAT'S WHAT IT SAYS HERE, YES.

Q. OKAY. NOW, YOU PAINTED A PICTURE OF THE STATE OF THE ART FOR HEPATITIS C IN YOUR DIRECT TESTIMONY AS OF JANUARY OF 2002; RIGHT?

A. I DID, YEAH.

Q. AND SO I JUST WANT TO ASK YOU A FEW QUESTIONS ABOUT THAT.

NOW, BY JANUARY OF 2002, THERE WERE ABOUT 15 NUCLEOSIDE ANALOG DRUGS APPROVED OR IN CLINICAL TRIALS FOR CONDITIONS LIKE HIV, HEPATITIS B, HERPES, CMV; RIGHT?

A. CORRECT.

Q. OKAY. AND SCIENTISTS UNDERSTOOD THAT MOST OF THOSE NUCLEOSIDE ANALOG DRUGS WORKED BY A MECHANISM CALLED CHAIN TERMINATION; IS THAT RIGHT?

A. CORRECT.

Q. DO I HAVE THAT RIGHT?

A. CHAIN TERMINATION IS CORRECT.

Q. OKAY. AND YOU'VE BEEN IN THE COURTROOM SINCE THE BEGINNING OF TRIAL, HAVEN'T YOU, SIR?

A. YES.

Q. AND WE HEARD YESTERDAY OF THIS CONCEPT OF A BLANKET, OR EXCUSE ME, OF A STOP SIGN, A STOP SIGN THAT WAS USED YESTERDAY WITH ONE OF THE WITNESSES FOR CHAIN TERMINATION. DO YOU RECALL THAT?

A. FROM DR. SOFIA OR?

Q. RIGHT, EXACTLY.

A. YES.

Q. BUT THAT'S CHAIN TERMINATION? THE ANALOG COMES IN AND IT STOPS THE CHAIN FROM GROWING; RIGHT?

A. THAT'S FAIR.

Q. OKAY. NOW, IN YOUR EXPERT REPORT, YOU CITE TO A 2001 ARTICLE BY A DR. DE CLERCQ IDENTIFIES NUCLEOSIDE ANALOG DRUGS AVAILABLE BY 2001; ISN'T THAT RIGHT?

A. I DID, YES.

Q. OKAY. WELL, LET'S TAKE A LOOK AT THAT. CAN WE PUT UP EXHIBIT 920.

AND IT'S IN YOUR BINDER, SIR, IF YOU WOULD LIKE TO LOOK AT THE PAPER. IT WILL ALSO BE UP ON THE SCREEN.

A. YES.

Q. AND ARE YOU THERE?

A. I SEE IT, YES.

Q. AND DO YOU RECOGNIZE THAT PAPER?

A. I DO, YES.

Q. AND THAT'S DE CLERCQ'S 2001 REVIEW ARTICLE ON ANTI-VIRAL DRUGS: CURRENT STATE OF THE ART?

A. YES.

MR. FISHER: OKAY. I MOVE ITS ADMISSION.

MR. FARRELL: NO OBJECTION.

THE COURT: IT WILL BE ADMITTED.

(DEFENDANTS' EXHIBIT 920 WAS RECEIVED IN EVIDENCE.)

BY MR. FISHER:

Q. OKAY. DR. SEEGER, IF YOU GO TO PAGE 74 OF THAT PAPER, THERE'S A VARIETY OF CATEGORIES OF COMPOUNDS LISTED AS NUCLEOSIDE ANALOGS, AND YOU CAN EITHER USE THE PAPER COPY IN FRONT OF YOU OR YOU CAN USE WHAT IS UP ON THE SCREEN.

DO YOU SEE PAGE 74, THERE'S A HEADING ANTI-HIV COMPOUNDS?

A. I DO, YES.

Q. OKAY. AND IT'S -- THE HEADING IS NUCLEOSIDE REVERSE TRANSCRIPTASE INHIBITORS?

A. CORRECT.

Q. AND THEY LIST IN THIS PAPER -- AND AGAIN, FEEL FREE TO USE

THE PAPER COPY IF YOU WOULD LIKE -- A NUMBER OF NUCLEOSIDE ANALOG INHIBITOR DRUGS, THE 15 THAT WE HAVE BEEN REFERRING TO. ALL RIGHT?

A. YES.

Q. AND I WANT TO GO THROUGH THEM.

A. I'D LIKE TO GO TO THE EXHIBIT HERE.

Q. ABSOLUTELY.

A. AND EXHIBIT?

Q. EXHIBIT 920, SIR. YOU'VE GOT TO HAVE THE RIGHT BINDER. THERE ARE TWO. MR. FARRELL GAVE YOU ONE.

I'M HAPPY TO HELP YOU WITH IT IF YOU WOULD LIKE.

A. I'VE GOT IT.

Q. YOU'VE GOT IT?

A. YES.

Q. AND IT'S PAGE 74.

A. 74. CORRECT, YEP.

Q. ALL RIGHT. SO THE FIRST NUCLEOSIDE ANALOG DRUG THAT IS LISTED THERE IS AZT. DO YOU SEE IT?

A. YES.

Q. AND IN 2001, AZT WAS AN FDA APPROVED NUCLEOSIDE ANALOG DRUG?

A. THAT'S CORRECT.

Q. OKAY. AND AZT ACTS AS A CHAIN TERMINATOR; RIGHT?

A. YEAH, I BELIEVE SO, YES.

Q. ALL RIGHT. AND WE'VE HIGHLIGHTED THIS UP ON THE SCREEN IN

CASE IT'S EASIER FOR YOU TO LOOK AS YOU FLIP. IT'S UP TO YOU.

NOW, THE SAME WITH THE DRUG DIDANOSINE?

A. YES.

Q. AND THAT ALSO WAS AN FDA APPROVED NUCLEOSIDE ANALOG DRUG IN 2001?

A. I BELIEVE SO.

Q. AND IT'S A CHAIN TERMINATOR?

A. IT LOOKS LIKE, YES.

Q. SAME WITH ZALCITABINE, THE NEXT ONE IN THE PAPER?

A. YES.

Q. AND THAT ALSO WAS FDA APPROVED IN '01?

A. I DON'T KNOW EXACTLY WHEN IT WAS APPROVED, BUT I TAKE YOUR WORD FOR IT.

Q. OKAY. THE PAPER SO INDICATES. DO YOU HAVE ANY REASON TO DISAGREE WITH WHAT THE PAPER SAYS?

A. I HAVE NO REASON.

Q. OKAY. IT WAS ALSO A CHAIN TERMINATOR?

A. YES.

Q. OKAY. AND THEN THE NEXT ONE IS STAVUDINE, AND THAT'S UP ON THE SCREEN. IT MAY BE EASIER TO LOOK THERE.

A. YES.

Q. AND THAT WAS ALSO FDA APPROVED IN '01?

A. YES.

Q. AND ALSO A CHAIN TERMINATOR?

A. CORRECT.

Q. AND THEN THERE WAS LAMIVUDINE, WHICH IS ALSO KNOWN AS 3TC?
A. YES.
Q. AND ALSO A CHAIN TERMINATOR?
A. YES.
Q. AND ALSO APPROVED IN '01?
A. OKAY.
Q. AND THERE'S TENOFOVIR DISOPROXIL, AND I MAY NOT BE PRONOUNCING THAT RIGHT.
A. TENOFOVIR, YES.
Q. OKAY. AND THAT WAS A NUCLEOSIDE ANALOG IN PHASE 3 CLINICAL STUDIES IN '01?
A. YES.
Q. AND THAT WAS FOR HIV?
A. OKAY.
Q. AND THAT'S AN ORAL PRODRUG OF TENOFOVIR?
A. THAT'S WHAT IT LOOKS LIKE.
Q. AND TENOFOVIR ACTS AS A CHAIN TERMINATOR?
A. I BELIEVE SO.
Q. AND THE NEXT ONE IS EMTRICITABINE. AGAIN, I MAY BE MISPRONOUNCING THAT.
A. YES.
Q. AND THAT WAS A DRUG THAT, IN 2001, WAS IN PHASE 2 AND 3 OF CLINICAL STUDIES FOR BOTH HIV AND HEPATITIS B; CORRECT?
A. I BELIEVE IT WAS.
Q. AND SIMILAR TO 3TC, THIS DRUG WAS A CHAIN TERMINATOR?

A. CORRECT.

Q. NOW, I WANT TO MOVE TO THE HEPATITIS B TREATMENTS THAT ARE LISTED IN THIS ARTICLE.

A. OKAY.

Q. THERE ARE TWO WE HAVEN'T COVERED, AND ONE IS ADEFOVIR DIPIVOXIL, AND IT'S ON PAGE 80 AND 81 OF THIS PAPER.

ARE YOU THERE, SIR?

A. YES.

Q. AND THAT WAS IN PHASE 3 CLINICAL STUDIES IN 2001; RIGHT?

A. CORRECT.

Q. AND THAT'S A CHAIN TERMINATOR, TOO; RIGHT?

A. YEAH.

Q. AND THAT WAS AN ORAL PRODRUG, ADEFOVIR DIPIVOXIL WAS AN ORAL PRODRUG OF ADEFOVIR; RIGHT?

A. YES.

Q. AND THE SECOND DRUG LISTED IN THAT CATEGORY WAS ENTECAVIR. DO YOU SEE THAT?

A. YES.

Q. AND IN '01, ENTECAVIR WAS IN PHASE 2 OF THOSE TRIALS?

A. CORRECT.

Q. AND THAT ALSO WAS A CHAIN TERMINATOR?

A. CORRECT.

Q. AND THE NEXT CATEGORY ARE THE ANTI-HERPES COMPOUND. THE FIRST ONE IS ACICLOVIR, ALSO KNOWN AS ACV, AND THIS IS ON PAGE 81.

A. YES.
Q. DO YOU SEE THAT? AND IN 2001, ACV WAS AN FDA APPROVED NUCLEOSIDE ANALOG FOR HERPES; RIGHT?
A. YES.
Q. AND THAT ACTS AS A CHAIN TERMINATOR?
A. PRESUMABLY, YES.
Q. OKAY. AND THE NEXT ONE IN THAT CATEGORY IS VALACICLOVIR. ARE YOU THERE, SIR?
A. YES.
Q. AND IN '01 VALACICLOVIR WAS AN FDA APPROVED NUCLEOSIDE ANALOG FOR HERPES; RIGHT?
A. YES.
Q. AND VALACICLOVIR IS A PRODRUG FOR ACV; DO YOU SEE THAT?
A. I SEE THAT.
Q. AND SO ONCE METABOLIZED, VALACICLOVIR ACTS AS A CHAIN TERMINATOR; CORRECT?
A. CORRECT.
Q. AND THE THIRD IS PENCICLOVIR. DO YOU SEE THAT, SIR?
A. YEAH.
Q. AND IN '01, PENCICLOVIR WAS AN FDA APPROVED NUCLEOSIDE ANALOG FOR HERPES?
A. CORRECT.
Q. AND LIKE ACV, IT ACTS AS A CHAIN TERMINATOR.
A. CORRECT.
Q. AND I BELIEVE I MISSPOKE IN THE QUESTION BEFORE. I SHOULD

HAVE SAID IN '01 PENCICLOVIR WAS AN FDA APPROVED NUCLEOSIDE ANALOG FOR HERPES.

DO I HAVE THAT RIGHT? SIR, IS THAT RIGHT?

A. YES.

Q. SO THE NEXT ONE, SIR, IN THAT COLUMN IS FAMCICLOVIR; DO YOU SEE THAT?

A. YES.

Q. AND IN '01, FAMCICLOVIR WAS AN FDA APPROVED NUCLEOSIDE ANALOG FOR HERPES?

A. YES.

Q. AND FAMCICLOVIR WAS AN ORAL PRODRUG OF PENCICLOVIR?

A. OKAY.

Q. AND THAT DRUG, ONCE METABOLIZED, ACTS AS A CHAIN TERMINATOR; RIGHT?

A. OKAY.

Q. NOW, FINALLY -- AND WE'RE ALMOST DONE WITH THIS ARTICLE AND YOU'LL BE ABLE TO PUT IT BEHIND YOU -- ARE THE CYTOMEGALOVIRUS INHIBITORS?

A. OKAY.

Q. AND CYTOMEGALOVIRUS, FOR THE JURY, WHAT IS THAT?

A. THAT'S A LARGE DNA VIRUS WHICH IS SIMILAR TO THE HERPES VIRUSES, BUT DISTINCTLY CLASSIFIED.

Q. AND THAT CAUSES FATIGUE OR TIREDNESS IN PEOPLE THAT ARE INFECTED?

A. MULTIPLE AFFECTS, YES.

Q. OKAY. AND CMV INHIBITOR, THE FIRST ONE LISTED IS GANCICLOVIR. DO YOU SEE THAT?

A. I SEE THAT, YES.

Q. AND THAT WAS AN FDA APPROVED NUCLEOSIDE ANALOG CMV IN 2001; RIGHT?

A. YES, IT'S CALLED HSV AND CMV AND SOME OTHER HERPES VIRUSES.

Q. FAIR ENOUGH. AND THAT WAS FDA APPROVED?

A. IT WAS.

Q. AND THAT DRUG IS ADMINISTERED INTRAVENOUSLY; RIGHT?

A. POSSIBLY.

Q. OKAY. WELL, IF YOU LOOK DOWN AT THE PAGE IT SAYS ADMINISTRATION, INTRAVENOUSLY. DO YOU SEE THAT?

A. OKAY.

Q. DO YOU SEE THAT, SIR?

A. I DO SEE THAT.

Q. AND THEN FINALLY, THE LAST ONE, AND AGAIN, WE'LL BE DONE WITH THIS IS CIDOFOVIR?

A. YES.

Q. AND DO YOU SEE THAT WAS AN FDA APPROVED NUCLEOSIDE ANALOG FOR CMV IN 6130?

A. HERPES VIRUSES, YES.

Q. HERPES VIRUSES?

A. SEVERAL VIRUSES.

Q. SEVERAL VIRUSES. AND THAT ACTS AS A CHAIN TERMINATOR?

A. THAT'S WHAT IT SAYS.
Q. AND THAT ALSO IS ADMINISTERED INTRAVENOUSLY?
A. THAT'S WHAT IT SAID.
Q. AND I PREPARED A DEMONSTRATIVE TO SUMMARIZE THE TESTIMONY THAT YOU JUST GAVE, AND I PUT IT UP ON THE SCREEN AND IF YOU COULD LOOK AT IT AND LET ME KNOW IF THAT SUMMARIZES WHAT YOU YOU'VE JUST COVERED?
A. WELL, YOU COVERED A LOT, BUT I TAKE YOUR WORD THAT THIS IS MORE OR LESS WHAT WE WERE GOING THROUGH NOW.
Q. AND WE JUST REFERRED TO THE DE CLERCQ PAPER?
A. IT SEEMS IT DOES.
Q. WELL, LET ME KNOW IF YOU SEE ANYTHING INACCURATE.
NOW, IT LOOKS HERE THAT IN JANUARY OF '02 THERE WERE 16 NUCLEOSIDE -- EXCUSE ME. LET ME START THAT AGAIN.
AS OF JANUARY OF 2002, THERE WERE 16 NUCLEOSIDE ANALOG DRUGS THAT WERE FDA APPROVED OR IN LATE STAGE CLINICAL TRIALS; RIGHT?
A. THAT'S CORRECT.
Q. AND FOUR OF THOSE NUCLEOSIDE ANALOG DRUGS WERE PRODRUGS?
A. THAT'S HOW IT SEEMS, YES.
Q. AND THEY'RE ALL CHAIN TERMINATORS?
A. YEAH, THEY'RE CHAIN TERMINATORS.
Q. OKAY. NOW, I WANT TO SWITCH GEARS A LITTLE BIT AND TALK ABOUT SOME OF THE OTHER LITERATURE THAT WAS OUT THERE AND AVAILABLE PRIOR TO JANUARY OF '02. OKAY?

A. OKAY.
Q. AND NOW, AS OF JANUARY '02, THE NS5B POLYMERASE WAS A TARGET FOR DRUG DEVELOPMENT; RIGHT, SIR?
A. YEAH, THAT'S FAIR.
Q. AND WE'VE HEARD ABOUT TWO DIFFERENT TESTS THAT HAVE BEEN USED IN THIS SPACE; RIGHT? THERE'S ONE --
A. THAT'S CORRECT.
Q. THERE IS ONE THAT IS THE NS5B POLYMERASE ASSAY TEST?
A. YES.
Q. AND THE OTHER IS THE REPLICON ASSAY TEST?
A. FAIR.
Q. OKAY. AND WHEN WE'RE TALKING ABOUT THE NS5B POLYMERASE ASSAY TEST, WE'RE TALKING ABOUT THE TARGET PROTEIN BEING TESTED AGAINST A COMPOUND; RIGHT?
A. IN VITRO.
Q. IN VITRO. OKAY. IS THAT RIGHT?
A. THAT'S CORRECT.
Q. AND SO I WANT TO DIRECT YOUR ATTENTION TO A PAPER THAT YOU CITE IN YOUR EXPERT REPORT. IT'S EXHIBIT 2190 AND IT'S ALSO IN THE BINDER AND IT WILL ALSO BE UP ON THE SCREEN.
AND LET ME KNOW WHEN YOU'RE THERE, SIR. DO YOU HAVE IT?
A. NO. I HAVE IT HERE.
MR. FISHER: MAY I APPROACH THE WITNESS, YOUR HONOR?
THE COURT: YES.
THE WITNESS: 2190. YES.

BY MR. FISHER:

Q. NO PROBLEM. WE TRIED TO LIMIT THE NUMBER OF PAPER WE PUT IN THERE, BUT WE DIDN'T SUCCEED.

SO THAT PAPER IS A 2000 PAPER BY LESBURG; IS THAT RIGHT?

A. THAT'S WHAT IT SAYS.

Q. OKAY. AND YOU CITED IT IN YOUR EXPERT REPORT. ARE YOU AWARE OF THAT?

A. YEAH.

Q. PARAGRAPH 88 I'LL REPRESENT TO YOU.

A. OKAY.

Q. OKAY. ALL RIGHT.

I'D MOVE THE ADMISSION OF THIS PAPER. IT'S EXHIBIT 2190.

MR. FARRELL: NO OBJECTION, YOUR HONOR.

THE COURT: IT WILL BE ADMITTED.

(DEFENDANTS' EXHIBIT 2190 WAS RECEIVED IN EVIDENCE.)

BY MR. FISHER:

Q. ALL RIGHT. SIR, SO IF WE CAN LOOK BACK AT THE PAPER ON PAGE 294, AND THIS WILL BE UP ON THE SCREEN IF YOU WOULD RATHER FOLLOW ALONG ON THE SCREEN.

A. 294. CORRECT.

Q. AND IT'S UP ON THE SCREEN IF IT MAKES IT EASIER.

AND YOU SEE THERE'S A SECTION ENTITLED INHIBITORS OF HCV NS5B?

A. YES.

Q. AND DO YOU SEE THAT?

A. YEP.
Q. AND IT BEGINS BY SAYING THAT "HCV NS5B POLYMERASE IS A TARGET FOR THERAPEUTIC INTERVENTION TO PREVENT VIRAL REPLICATION."
DO YOU SEE THAT?
A. YES.
Q. OKAY. AND SO YOU AGREE THAT IN 2000, THE YEAR OF THIS PAPER, THAT HCV NS5B WAS A TARGET FOR THERAPEUTIC INTERVENTION?
A. IT WAS A TARGET, NO QUESTION.
Q. AND MERCK'S PATENTS STATE THAT NS5B WAS A TARGET FOR MERCK'S COMPOUNDS; RIGHT?
A. UM, WELL, WE HAVE TO BE CAREFUL BECAUSE, AGAIN -- LET'S GO AND LOOK AT THE STATEMENTS.
Q. SURE. LET'S GO BACK TO EXHIBIT 1, PLEASE, THE SECOND COLUMN.
DO YOU SEE THAT, SIR?
A. YES, I DO. I DO.
Q. OKAY. AND SO, AGAIN, MERCK WAS TARGETING THE NS5B POLYMERASE; RIGHT?
A. I DISAGREE WITH THAT STATEMENT.
Q. YOU DISAGREE THAT MERCK WAS TARGETING --
A. CERTAINLY NOT BASED ON THAT STATEMENT IN THE PATENT.
Q. IT SAYS THAT THE COMPOUNDS ARE INHIBITORS OF RNA-DEPENDENT VIRAL POLYMERASE, AND IN PARTICULAR HCV NS5B POLYMERASE?
A. IT MAY SAY THAT, BUT THERE'S NO DATA.

Q. I UNDERSTAND.
A. THERE'S ZERO DATA.
Q. I UNDERSTAND. AND I'M NOT ARGUING WITH YOU ON THAT POINT.
BUT THE TARGET, WHAT THEY WERE TRYING TO TARGET WAS THIS POLYMERASE; RIGHT?
A. I DISAGREE.
Q. NOW BACK TO THE PAPER. SCIENTISTS IN 2002 INDICATE THAT THE INHIBITION -- THEY KNEW THAT INHIBITION OF HCV NS5B POLYMERASE WAS AN ATTRACTIVE TARGET FOR THE DEVELOPMENT OF HCV SPECIFIC ANTI-VIRALS; RIGHT?
A. THAT'S A FAIR STATEMENT.
Q. AND YOU SAY THAT BASICALLY IN YOUR EXPERT REPORT?
A. THAT'S A FAIR STATEMENT.
Q. NOW, LESBURG SAYS, AND THIS IS IN THE LINE THAT IS NEXT HIGHLIGHTED BEGINNING DEVELOPMENT, THAT THE DEVELOPMENT OF HIV, REVERSE TRANSCRIPTASE INHIBITORS, DEMONSTRATES THE UTILITY OF POLYMERASE INHIBITORS AS EFFECTIVE ANTI-VIRALS.
DO YOU SEE THAT HIGHLIGHTED IN THE PAPER?
A. I READ THE STATEMENT, YEAH.
Q. AND THERE'S NO REASON TO DISAGREE WITH THAT STATEMENT, DO YOU AGREE, SIR?
A. THE UTILITY FOR WHAT? I MEAN, IF I LOOK AT THAT STATEMENT, THERE'S NOT -- I WOULD SAY -- I WOULD SAY THAT WE KNEW THAT THERE WERE HIV RT INHIBITORS. THAT'S MY STATEMENT.
Q. OKAY.

A. I WOULDN'T HAVE PHRASED IT THAT WAY, BUT, YEAH.
Q. OKAY. BUT THIS IS A PAPER THAT YOU CITED IN YOUR EXPERT REPORT?
A. ACTUALLY I CITED THAT PAPER FOR A VARIETY OF REASONS, AND ACTUALLY I QUESTION SOME. AND I BELIEVE WHEN I READ 88 -- WE SHOULD 88 WHY I CITED IT, AND I BELIEVE THERE WAS A REASON AND I ACTUALLY DISAGREE WITH THE STATEMENTS MADE IN LESBURG.
SO I UNDERSTAND THE SENTENCE IS HERE.
BUT, AGAIN, I WOULD NOT PHRASE IT LIKE THAT.
Q. OKAY. ALL RIGHT. BUT THIS IS WHAT THE PAPER SAYS?
A. THAT'S WHAT THE PAPER SAYS.
Q. OKAY. NOW, I'D LIKE TO MOVE TO ANOTHER PAPER THAT YOU CITE IN YOUR EXPERT REPORT.
A. OKAY.
Q. EXHIBIT 2170. IT'S AN ARTICLE BY WALKER?
A. 2170. YEAH.
Q. OKAY. AND YOU SEE THAT THIS IS THE WALKER PAPER THAT YOU CITE IN YOUR REPORT?
A. COULD YOU PLEASE REMIND ME WHERE I CITED IT?
Q. IT'S AT PARAGRAPH 47.
A. 47.
Q. YES.
MR. FISHER: ALL RIGHT. I MOVE THE ADMISSION OF THIS PAPER.
MR. FARRELL: NO OBJECTION.

MR. FISHER: IT'S EXHIBIT 2170.

THE COURT: IT WILL BE ADMITTED.

(DEFENDANTS' EXHIBIT 2170 WAS RECEIVED IN EVIDENCE.)

BY MR. FISHER:

Q. SO WALKER, LIKE THE PAPER WE JUST DISCUSSED, DISCUSSES USING NS5B POLYMERASE AS A TARGET FOR ANTI-HCV AGENTS?

A. I BELIEVE THAT'S CORRECT. I HAVEN'T SEEN THE SENTENCE, BUT I BELIEVE IT'S CORRECT.

Q. OKAY. WELL, WHY DON'T WE GO TO PAGE 11, AND THE FIRST CALL OUT.

A. YEAH.

Q. OKAY. DO YOU SEE HOW THIS IS DIRECTED AT NS5B?

A. YES, IT IS.

Q. OKAY. AND HERE IT INDICATES THAT POLYMERASE INHIBITORS FOR OTHER VIRUSES, INCLUDING SEVEN APPROVED NUCLEOSIDE HIV REVERSE TRANSCRIPTASE INHIBITORS HAVE BEEN SUCCESSFULLY MARKETED; RIGHT?

A. CORRECT.

Q. AND THEN IT GOES ON TO SAY THIS CLEARLY SUGGESTS POTENTIAL OF THIS TARGET FOR ANTI-HCV DEVELOPMENT.

DO YOU SEE THAT?

A. THE POTENTIAL, YES, I SEE THAT.

Q. ALL RIGHT. AND THEN IN THE SECOND COLUMN OF THAT PAGE OF WALKER, THERE'S A STATEMENT ABOUT CHAIN TERMINATORS.

DO YOU SEE THAT?

A. YES.

Q. AND IT SAYS CHAIN TERMINATORS ARE PROVEN VIRAL DNA POLYMERASE INHIBITORS AND ANALOGOUS RNA POLYMERASE INHIBITORS ARE PREDICTED.

DO YOU SEE THAT?

A. I SEE THAT.

Q. OKAY. AND THEN WALKER TALKS ABOUT TWO MERCK COMPOUNDS. DO YOU SEE THAT?

A. I DO. OKAY.

Q. WE CAN HIGHLIGHT IT THERE, SIR.

A. YES. YEAH.

Q. AND WALKER SAYS THAT MERCK DESCRIBED TWO RIBONUCLEOSIDE ANALOGS THAT APPEAR TO ACT AS CHAIN TERMINATORS.

DO YOU SEE THAT?

A. I DO, YES.

Q. AND CAN WE GO TO THE BOTTOM OF THAT PAGE. THE NEXT PAGE, IT'S ACTUALLY THE TOP LEFT, SIR.

DO YOU SEE THAT?

A. I DO SEE THIS.

Q. FIGURE 6, STRUCTURE OF NUCLEOSIDE INHIBITORS OF NS5B?

A. YEAH, I DO.

Q. OKAY. AND YOU SEE HOW THERE ARE TWO STRUCTURES DESCRIBED THERE THAT ARE MERCK COMPOUNDS?

A. I DO.

Q. AND, SIR, YOU HAVE NO REASON TO BELIEVE THAT THOSE ARE NOT

EXAMPLES IN MERCK'S PATENTS; RIGHT?

A. I JUST DON'T KNOW.

Q. OKAY. YOU DIDN'T CONSIDER THIS POINT, DID YOU?

A. THEY CERTAINLY ARE NOT -- OKAY.

YEAH, I -- OFFHAND I DO NOT KNOW WHETHER THEY ARE IN THE PATENT.

Q. OKAY. I WANT TO TALK ABOUT THE DATA POINT FOR A MINUTE.

NOW, AS I UNDERSTAND YOUR CRITICISM, IT IS THAT THERE ARE -- THERE'S NO DATA FOR COMPOUNDS WITHIN THE SCOPE OF THE PATENT CLAIMS; RIGHT?

A. THERE'S NO DATA FOR THE CLAIMS.

Q. THERE'S NO DATA FOR COMPOUNDS WITHIN THE SCOPE OF THE PATENT CLAIMS?

A. THERE'S NO DATA FOR THE CLAIMS.

Q. OKAY. FAIR ENOUGH.

IN YOUR EXPERT REPORT YOU TALK ABOUT 16 EXAMPLES. DO YOU RECALL THIS?

A. I DO.

Q. AND YOU GO THROUGH THOSE 16 EXAMPLES IN YOUR EXPERT REPORT. DO YOU REMEMBER THAT?

A. WELL, I KNOW -- I KNOW WE LISTED, YES, THESE EXAMPLES, CORRECT.

Q. OKAY. AND SOME OF THOSE EXAMPLES YOU POINT OUT SUGGEST THAT THE COMPOUNDS ARE TOXIC; RIGHT?

A. I THINK WE DID, YEAH.

Q. AND SOME OF THE EXAMPLES YOU POINT OUT COMPOUNDS ARE NOT ACTIVE; RIGHT?

A. CORRECT.

Q. OKAY. AND YOU USED THOSE EXAMPLES AS SUPPORT FOR YOUR BELIEF THAT THE CLAIMED COMPOUNDS ARE NOT USEFUL; RIGHT?

A. THE CLAIMED COMPOUNDS ARE NOT USEFUL BECAUSE THERE'S NO DATA.

Q. RIGHT. BUT THE REASON WHY YOU DISCUSS THOSE 16 EXAMPLES IS BECAUSE YOU ARE EXTRAPOLATING TO WHAT IS IN THE CLAIM; RIGHT?

A. I'M NOT EXTRAPOLATING. I'M SAYING AND STATING THAT THERE IS NO DATA WHATSOEVER --

Q. SIR, HAVE YOU EVER --

A. -- TO SUPPORT THE CLAIMS. THAT'S IT.

Q. HAVE YOU EVER HEARD OF THE CONCEPT OF STRUCTURE ACTIVITY RELATIONSHIP, SIR?

A. I HAVE HEARD ABOUT IT.

Q. OKAY. YOU'RE NOT EXPRESSING ANY OPINION ABOUT STRUCTURE ACTIVITY RELATIONSHIP?

A. I LEAVE THAT TO THE CHEMIST.

Q. OKAY. FAIR ENOUGH.

SO AS FAR AS YOU'RE CONCERNED, YOU COULD HAVE 99 COMPOUNDS THAT ARE VERY STRUCTURALLY SIMILAR TO WHAT, THE ONE COMPOUND THAT IS CLAIMED, BUT IF THERE IS NO DATA ON THE ONE COMPOUND CLAIMED, THAT'S IT? IT'S NOT USEFUL?

A. PRECISELY. EXACTLY.
Q. OKAY.
A. YOU NEED DATA FOR EVERY COMPOUND IN 2002 AND IN 2016 BECAUSE THERE'S NO PREDICTABILITY.
Q. OKAY. FAIR ENOUGH.
NOW, ONE OF THE THINGS THAT I HEARD YOU TALK ABOUT WAS ACTIVITY LEVELS, AND MR. FARRELL DIRECTED YOU TO AN EXHIBIT WHERE THE CUTOFF FOR ACTIVITY WAS 50 MICROMOLAR.
DO YOU REMEMBER THAT?
A. I -- I REMEMBER THAT, YEAH.
Q. OKAY. WHY DON'T WE TAKE A LOOK AT THAT EXHIBIT. IT IS EXHIBIT 0168. AND IF WE CAN GO TO THE SECOND PAGE OF THE EXHIBIT.
A. YES.
Q. AND HIGHLIGHT THE COMPOUND THAT MR. FARRELL DIRECTED YOU TO.
OKAY. NOW, WAS THIS THE COMPOUND THAT YOU WERE TESTIFYING ABOUT WITH MR. FARRELL?
A. I BELIEVE SO, YEAH.
Q. AND OKAY. IT SAYS NOT ACTIVE AT 50 MICROMOLAR?
A. CORRECT.
Q. OKAY. YOU WOULD AGREE THAT AS OF JANUARY OF 2002, THERE WERE NO REPORTED INHIBITORS OF NS5B OR IN THE REPLICON THAT WAS LESS THAN 100 MICROMOLAR; RIGHT?
A. THAT IS CORRECT I BELIEVE, YEAH.

Q. AND YOU BASICALLY SAY THAT IN YOUR REPORT --

A. YEAH.

Q. -- IN A COUPLE OF PLACES. AND YOU SAY THAT AS OF JANUARY '02, YOU'RE NOT AWARE OF ANY PUBLISHED LITERATURE DESCRIBING ACTIVITY OF NUCLEOSIDE INHIBITORS IN THE HCV REPLICON ASSAY PERIOD, RIGHT, SO THERE WAS NOTHING IN THE REPLICON ASSAY?

A. THAT'S CORRECT.

Q. AND FOR NSB5 --

A. NS5B.

Q. EXCUSE ME, NS5B.

YOU'RE NOT AWARE OF ANY PUBLICATION DESCRIBING A STRUCTURE THAT HAD ACTIVITY LESS THAN 100 MICROMOLAR; RIGHT?

A. DURING THAT TIMEFRAME, YEAH.

Q. AND, IN FACT, A COUPLE OF REFERENCES THAT YOU HAD IN YOUR REPORT HAD ACTIVITY LEVELS WELL ABOVE 100 MICROMOLAR; RIGHT?

A. I -- I -- ACTIVITY LEVELS OVER 100 MICROMOLAR TO MEAN THAT THEY'RE INACTIVE? CAN WE LOOK AT IT?

Q. SURE. SURE. ABSOLUTELY. LET'S TAKE A LOOK AT EXHIBIT 2187.

DO YOU HAVE THAT, SIR?

A. 2187?

Q. YEP. DO YOU HAVE THAT PAPER, SIR? IT'S ALSO UP ON THE SCREEN. IT MAY BE EASIER TO LOOK AT.

A. YEAH, I DO.

Q. IT'S A PAPER BY DYMOCK?
A. YES.
Q. AND IT'S IN 2000?
A. YES.
Q. OKAY. AND I WANT TO DIRECT YOUR ATTENTION TO PAGE 815.
I MIGHT AS WELL MOVE THE ADMISSION OF 2187?
MR. FARRELL: NO OBJECTION.
THE COURT: IT WILL BE ADMITTED.
(DEFENDANTS' EXHIBIT 2187 WAS RECEIVED IN EVIDENCE.)
THE WITNESS: OKAY.
BY MR. FISHER:
Q. OKAY. AND SO THE PAPER DESCRIBES A COUPLE OF VERY WEAK INHIBITORS OF THE POLYMERASE AND THE POLYMERASE BEING NS5B; RIGHT?
A. IT MIGHT DO THAT. I DISAGREE WITH THE STATEMENT, BUT IT MIGHT DO IT.
Q. I'M SORRY?
A. YEAH. I MEAN, I READ IT. I READ IT.
Q. OKAY.
A. YEAH.
Q. AND SO THIS PAPER IS REPORTING ON ACTIVITY OF INHIBITORS OF THE POLYMERASE THAT ARE ABOVE 100; RIGHT?
A. IT MAKES NO SENSE, I'M SORRY. THIS IS -- THIS IS -- IN MY VIEW, THIS WHOLE SECTION HERE IS FLAWED BECAUSE THE PERSON OF SKILL KNOWS THAT SUCH HIGH CONCENTRATIONS ARE MEANINGLESS.

Q. OKAY. OKAY. LET'S TAKE A LOOK AT THE 2000 LESBURG PAPER WHICH IS EXHIBIT 2190.

A. OKAY.

Q. OKAY. AND LET'S GO TO PAGE 775 OF THIS. WE HAD ALREADY LOOKED AT THIS EARLIER.

2190.21.

LET'S GO TO 2190.7. IT'S UP ON THE SCREEN, SIR, IF YOU WOULD LIKE.

A. YEAH.

Q. OKAY.

A. A PERFECT EXAMPLE OF WHAT I JUST SAID.

Q. SO IT SAYS THE HIV RT NUCLEOSIDE INHIBITOR 3TC TRIPHOSPHATE WAS MODESTLY INHIBITORY OF HCV NS5B (IC50 OR GREATER TO 180 MICROMOLAR.

RIGHT?

A. JUST AS I SAID, IF YOU GO INTO THESE HIGH CONCENTRATIONS, THE PERSON OF SKILL KNOWS EXACTLY THAT THOSE ARE NO DIRECT EFFECTS BECAUSE THE PERSON OF SKILL KNOWS THAT WHEN YOU GO WITH THESE HIGH CONCENTRATIONS THERE ARE ALL SORTS OF SECONDARY EFFECT.

AND SO I WOULD SAY IT'S A PERFECT EXAMPLE BECAUSE THE PERSON OF SKILL KNOWS THAT SINCE HIV IS A DNA VIRUS AND USES DNA AS THE BUILDING BLOCKS, THERE IS NO REASON TO BELIEVE THAT THE COMPOUND AGAINST HIV WOULD ACTUALLY WORK AGAINST AN RNA VIRUS.

SO IT'S JUST A PERFECT -- LIKE HCV.

SO IT'S A PERFECT EXAMPLE OF AN ACTIVITY THAT IS UNSPECIFIC AND INDIRECT.

Q. SO THE STATEMENT SAYS THAT THIS INHIBITOR WAS MODESTLY INHIBITORY. DO YOU DISAGREE WITH THAT?

A. THAT'S AN INDIRECT -- IF WE'RE TALKING ABOUT DIRECT ANTI-VIRAL EFFECT, THAT'S NOT A DIRECT ANTI-VIRAL EFFECT IN MY VIEW.

Q. SO THIS IS ANOTHER PAPER THAT YOU DISAGREE WITH?

A. I DO, YES.

Q. NOW, I WANT TO GO BACK TO THIS EXHIBIT 168 THAT MR. FARRELL DIRECTED YOU TO AND TAKE A LOOK AT ANOTHER ONE OF THE OTHER COMPOUNDS IN THAT PAPER. OKAY?

A. OKAY.

Q. LET'S GO TO THE SECOND PAGE AND LOOK AT THE MIDDLE COMPOUND.

OKAY. DO YOU SEE AT THE BOTTOM --

A. SORRY. PLEASE JUST GET ME THE NUMBER OF THE EXHIBIT ONCE MORE.

Q. SURE. IT'S EXHIBIT 168 IN MR. FARRELL'S BINDER.

I CAN HELP YOU GET THERE IF NEED BE.

A. YEAH, I GOT IT.

Q. YOU'VE GOT IT.

AND SO UP ON THE SCREEN IN THE MIDDLE OF THAT SECOND PAGE IS A STRUCTURE; RIGHT?

A. PAGE WHAT?
Q. THIS IS PAGE 2 OF THE --
A. YES. OKAY.
Q. ALL RIGHT. AND THIS IS THE STRUCTURE RIGHT NEXT TO THE ONE THAT MR. FARRELL DIRECTED YOU TO; RIGHT?
A. CORRECT.
Q. AND THIS STRUCTURE WITH THE NUMBERS ENDING IN 884, DO YOU SEE THAT?
A. I DO.
Q. AND HAVE YOU EVER HEARD OF THE 884 COMPOUND?
A. WELL, NOT THE NUMBER. BUT I RECOGNIZE THE COMPOUND.
Q. OKAY. THIS IS ONE OF MERCK'S COMPOUNDS?
A. THAT'S A DOUBLE RING ADENINE DERIVATIVE, CORRECT.
Q. OKAY. YOU UNDERSTAND THIS TO BE MERCK'S DEVELOPMENT COMPOUND, MK-0608?
A. I DON'T KNOW THE EXACT COMPOUND, BUT I TAKE YOUR WORD FOR IT.
Q. OKAY. YOU AGREE THAT THE EC50 IS EQUAL TO .2 MICROMOLAR; CORRECT?
A. THAT'S WHAT IT SAYS.
Q. NOW, EC50, THAT'S AN INDICATION THAT THE COMPOUNDS ON THIS PAGE WERE BEING TESTED IN THE REPLICON ASSAY; RIGHT?
A. THAT'S CERTAINLY A POSSIBILITY.
EC50 IS AN EFFECTIVE CONCENTRATION AND 50 PERCENT INHIBITION. IT COULD ALSO BE IN THE IN VITRO POLYMERASE ASSAY.

BUT IT'S QUITE POSSIBLE THAT THIS IS FROM THE REPLICON, CORRECT.

Q. OKAY. AND LET'S GO BACK TO THE OTHER, THE COMPOUND THAT MR. FARRELL WAS ASKING YOU ABOUT.

YOU DON'T KNOW, AS YOU SIT HERE TODAY, WHETHER THIS COMPOUND WAS TESTED IN THE REPLICON OR THE NS5B PRELIMINARY ASSAY; RIGHT?

A. YES, I DO.

Q. OKAY. AND, WELL, WHAT IS THAT TESTED AT?

A. IF IT WERE TESTED IN THE IN VITRO ASSAY, IT WOULD HAVE BEEN THE TRIPHOSPHATE, AND THERE'S NO -- I DON'T SEE THE TRIPHOSPHATE HERE.

Q. OKAY. SO, AGAIN, THAT MEANS WITH ALL OF THE COMPOUNDS ON THIS PAGE, THEY WERE TESTED IN THE REPLICON; RIGHT?

A. THAT WOULD SUGGEST THAT IT'S IN THE REPLICON ASSAY.

Q. ALL RIGHT. AND YOU HAVEN'T LOOKED AT THE DATA ON THE TRIPHOSPHATE VERSIONS OF ANY OF THE COMPOUNDS ON THIS PAGE TO SEE WHAT THE ACTIVITY WOULD BE; RIGHT?

A. I DON'T THINK I HAVE SEEN THOSE -- I HAVE SEEN THE RESULTS FROM THE TRIPHOSPHATE ASSAYS, IF THEY WERE DONE.

Q. OKAY. LET'S ASSUME THAT THIS 942 COMPOUND HAD A POTENCY OR AN ACTIVITY LEVEL OF 15 MICROMOLAR IN THE NS5B ASSAY AS A TRIPHOSPHATE. LET'S ASSUME THAT, OKAY? CAN YOU ASSUME THAT?

A. IT'S A HYPOTHETICAL.

Q. ARE YOU WITH ME?

A. I'M WITH YOU, YEAH.
Q. AND SO YOU WOULD AGREE WITH ME THAT THAT WOULD BE A USEFUL COMPOUND; RIGHT?
A. NOT NECESSARILY.
Q. AS AN INHIBITOR AS AN NS5B POLYMERASE; RIGHT?
A. MAYBE. MAYBE NOT. I WOULD -- IT DEPENDS ON WHAT -- USEFULNESS FOR WHAT?
Q. WELL, ONE OF THE USES THAT WAS DISCUSSED WITH YOU PREVIOUSLY WAS USE IN A LABORATORY AS A COMPARATOR COMPOUND?
A. IN THE LABORATORY AS A TOOL, IN THE IN VITRO ASSAY IT COULD BE USEFUL, YEAH.
Q. OKAY. AND IF A COMPOUND HAPPENED TO BE USEFUL IN AN NS5B ASSAY, BUT NOT USEFUL IN THE REPLICON, THERE ARE VARIOUS STRATEGIES ONE COULD EMPLOY TO IMPROVE UPON THAT COMPOUND; RIGHT?
A. UM, FROM THE POINT OF VIEW OF THE VIROLOGIST, YOU GO ON WITH OTHER COMPOUNDS AND YOU NEED TO LOOK AT TOXICITY UPTAKE AND WE HAVE HEARD FROM THE TRANSFORMATION OF THE TRIPHOSPHATE INTO CELLS AND SO IT'S VERY COMPLEX.
Q. AND I WANT TO MOVE TO A DIFFERENT TOPIC.
A. OKAY.
Q. AND LET'S TALK ABOUT HIGH THROUGHPUT SCREENING.
A. YEAH.
Q. YOU NEVER WORKED FOR A PHARMACEUTICAL COMPANY; RIGHT, SIR?
A. THAT'S CORRECT.

Q. AND YOU'VE NEVER BEEN INVOLVED IN DEVELOPING A HIGH THROUGHPUT SCREENING ASSAY?

A. YES, I WAS.

Q. WHEN WERE YOU INVOLVED, SIR?

A. IN 1992 MY LABORATORY WAS THE FIRST TO EXPRESS THE HEPATITIS B VIRUS, REVERSE TRANSCRIPTASE POLYMERASE IN AN ENZYMATICALLY FORM IN VITRO, AND WITH A SMALL COMPANY, WE PUT THIS INTO A HIGH THROUGHPUT WITH THE HELP OF A COMPANY CALLED PARK DAVIS.

Q. OKAY. FAIR ENOUGH.

YOU'VE NEVER BEEN INVOLVED IN DEVELOPING A HIGH THROUGHPUT SCREEN FOR HEPATITIS C?

A. THAT'S CORRECT.

Q. FAIR ENOUGH. I ASKED YOU THE WRONG QUESTION.

NOW, YOU CITE TO A COUPLE OF PAPERS AND ONE OF THEM IS THE ZUCK PAPER FROM '04?

A. THAT'S CORRECT.

Q. AND THAT WAS FROM EXHIBIT 2172?

A. THAT'S CORRECT.

Q. AND MR. FARRELL ASKED YOU ABOUT THAT PAPER?

A. YES.

Q. AND IT WAS A MERCK PAPER?

A. THAT'S CORRECT.

Q. AND IT SAYS THAT MERCK, IN 2004, WAS REPORTING ON A HIGH THROUGHPUT SCREEN THAT IT HAD DEVELOPED; RIGHT?

A. THAT'S CORRECT.

Q. OKAY. NOW, IN YOUR EXPERIENCE, IT CAN TAKE TWO TO THREE YEARS FROM THE TIME YOU START WORK ON A PROJECT UNTIL YOU PUBLISH; RIGHT?

A. THAT'S FAIR.

Q. OKAY. AND PHARMACEUTICAL COMPANIES ARE NOT IN THE BUSINESS OF PUBLISHING; RIGHT?

A. THAT DEPENDS ON WHAT THE SUBJECT MATTER IS.

Q. OKAY. BUT WHAT THEY'RE IN THE BUSINESS OF IS DEVELOPING LIFESAVING DRUGS; RIGHT?

A. WELL, THAT'S A FAIR STATEMENT.

Q. AND PUBLISHING, IF THEY DO IT, IS SECONDARY; RIGHT?

A. AGAIN, THAT DEPENDS ON THE DEPARTMENT AND THE SUBJECT MATTER.

Q. SIR, ARE YOU AWARE THAT IN APRIL AND MAY OF 2001, MERCK USED A HIGH THROUGHPUT SCREEN TO ASSAY 268,000 COMPOUNDS FOR HEPATITIS C?

A. NUCLEOSIDE ANALOGS OR SMALL MOLECULES?

Q. BOTH.

A. SMALL MOLECULES?

Q. BOTH, I SAID. BOTH.

A. I HAVE NOT SEEN INTERNAL DATA FROM MERCK.

Q. YOU UNDERSTAND THAT THAT INTERNAL DATA WAS PRODUCED IN THIS CASE; RIGHT, SIR?

A. YES.

Q. OKAY. NOW, SIR, I WANT TO TURN TO EXHIBIT 2642.

CAN YOU PUT THAT UP. DO YOU SEE IT UP THERE? IT'S EXHIBIT B TO YOUR EXPERT REPORT?

A. YES.

MR. FARRELL: YOUR HONOR, COULD WE JUST APPROACH ON THIS? I THOUGHT THIS WAS AN ISSUE WE WEREN'T GOING TO GO INTO. NOW IT'S COMING UP.

THE COURT: SURE.

(SIDE-BAR CONFERENCE ON THE RECORD.)

MR. FARRELL: YOUR HONOR, THANK YOU.

I CERTAINLY DON'T OBJECT TO HIM TALKING ABOUT HOW MUCH HE'S BEEN PAID AND WHAT HAVE YOU, BUT HE PUT UP FOUR CASES IN WHICH HE TESTIFIED AGAINST VARIOUS PEOPLE AND I THOUGHT WE WEREN'T GOING TO BRING UP OTHER CASES.

MR. FISHER: THAT'S NOT NECESSARY FOR THIS POINT.

I'M SIMPLY GOING TO MAKE THE POINT THAT HE TESTIFIED IN FIVE CASES IN THE LAST SEVERAL YEARS, ALL FOR GILEAD AND NOT GETTING INTO THE CASES.

THE COURT: THEN LET'S TAKE THE DEMONSTRATIVE DOWN.

(END OF DISCUSSION AT SIDE-BAR.)

THE COURT: THE OBJECTION IS SUSTAINED.

BY MR. FISHER:

Q. DR. SEEGER, YOU TESTIFIED FOR GILEAD BEFORE; CORRECT?

A. I DID.

Q. AND IN THE LAST SEVERAL YEARS YOU'VE TESTIFIED

APPROXIMATELY FIVE TIMES FOR GILEAD?

A. THAT'S CORRECT.

Q. AND YOU HAVEN'T TESTIFIED FOR ANY OTHER COMPANY CURING THAT TIME; RIGHT?

A. NO, I DID NOT.

Q. OKAY.

NOTHING FURTHER AT THIS TIME.

THE COURT: THANK YOU.

REDIRECT FOR THIS WITNESS?

MR. FARRELL: YES, YOUR HONOR.

REDIRECT EXAMINATION

BY MR. FARRELL:

Q. DR. SEEGER, THOSE OTHER FIVE TIMES, SAYING THE SAME THING THAT YOU'RE SAYING HERE?

A. I HAVE SAID THE SAME THING, YEAH.

Q. A LOT OF QUESTIONS ABOUT NUCLEOSIDES THAT WERE AVAILABLE TO FIGHT VARIOUS VIRUSES IN 2001. I THINK THEY WERE HIV, HEPATITIS B, AND HERPES; CORRECT?

A. CORRECT.

Q. SO IS A NUCLEOSIDE ANALOG THAT CAN FIGHT HIV ONE THAT IS GOING TO FIGHT HEPATITIS C?

A. NO.

Q. WELL, WHAT IS THE DIFFERENCE BETWEEN THOSE TWO DISEASES IN REAL SIMPLE TERMS?

A. ONE VIRUS IS A DNA VIRUS; THE OTHER ONE IS AN RNA VIRUS.

THEY'RE VERY DIFFERENT VIRUSES.

Q. HIV IS ATTACKING DNA, AND HEPATITIS IS ATTACKING RNA; CORRECT?

A. CORRECT.

Q. AND WHAT ABOUT HERPES?

A. THAT'S AN DNA VIRUS.

Q. OKAY. BUT HEPATITIS B, I MEAN, THAT'S HEPATITIS, ISN'T THAT THE SAME THING?

A. HEPATITIS B IS MORE LIKE HIV. IT USES DNA AS BUILDING BLOCKS.

Q. SO IF A PERSON OF SKILL IN THE ART SAW THAT NUCLEOSIDE ANALOGS WERE BEING USED TO FIGHT DNA-BASED DRUGS, WHAT INFORMATION DO THEY GET FROM THAT AS TO WHETHER IT WOULD BE GOOD TO FIGHT AN RNA DRUG?

A. WELL, YOU'D HAVE TO DO -- YOU WOULD HAVE TO START FROM SCRATCH. YOU'D HAVE TO SCREEN. YOU'D HAVE TO TEST. YOU NEED DATA.

Q. NOW, I SAW IN SOME OF THE ARTICLES IT SAID, WELL, THIS IS HELPFUL TO THINK THAT MAYBE A GOOD TARGET TO FIGHT HEPATITIS C IS NS5B. DO YOU REMEMBER THAT?

A. YES.

Q. AND, WELL, EVERYONE KNEW THAT WAS THE GOAL; RIGHT?

A. YEAH.

Q. I MEAN, IT'S LIKE WE ALL WANT MORE WATER IN CALIFORNIA. THAT'S THE GOAL, RIGHT?

A. THAT'S THE GOAL.
Q. THE HARD IS GETTING THERE; RIGHT?
A. THAT'S CORRECT.
Q. WHAT I'D LIKE TO GO BACK TO IS 0618 AND PAGE 002.
BY THE WAY, BEFORE I GET -- I APOLOGIZE.
YOU WERE ASKED A QUESTION TOWARD THE END THERE KIND OF QUICKLY ABOUT HIGH THROUGHPUT SCREEN.
I THINK THE QUESTION WAS, ARE YOU AWARE THAT MERCK IN 2001 HAD A HIGH THROUGHPUT SCREEN THAT SCREENED 200,000 COMPOUNDS.
DO YOU REMEMBER THAT QUESTION?
A. I REMEMBER THAT.
Q. AND THEN YOU ASKED HIM, NUCLEOSIDE COMPOUNDS?
AND I THINK THE QUESTION WAS, BOTH.
LET ME ASK YOU THIS: IN 2001, YOU COULD SCREEN 200,000 COMPOUNDS, COULDN'T YOU?
LET ME ASK YOU THIS WAY.
A. YEAH.
Q. COULD YOU SCREEN 200,000 NUCLEOSIDE COMPOUNDS?
A. ABSOLUTELY NOT BECAUSE THEY WEREN'T AVAILABLE AT THAT TIME. THEY'RE PROBABLY NOT AVAILABLE TODAY.
Q. NOW, I GUESS TECHNICALLY IF YOU SCREEN 199,999 SMALL MOLECULE COMPOUNDS AND ONE NUCLEOSIDE COMPOUNDS, YOU COULD SAY BOTH, COULDN'T YOU?
A. THAT'S FAIR.
Q. OKAY. SO NOW LET'S GO TO EXHIBIT 0168 ON PAGE 0002. I'M

GOING TO HOPE TO GO THROUGH THIS QUICKLY AND STOP BECAUSE IT'S LATE IN THE DAY, AND I HAVE A DEGREE IN SCIENCE, BUT IT'S POLITICAL SCIENCE.

SO IF WE CAN GO TO THE MIDDLE FIGURE STRUCTURE PICTURE.

A. YEAH.

Q. THAT ONE?

A. YEP.

Q. OKAY. NOW, I THINK YOU WERE TOLD OR ASKED ON CROSS THAT THIS WAS MERCK'S LEAD COMPOUND MK-0608; CORRECT?

A. CORRECT.

Q. AND THIS STRUCTURE IS NOT COVERED BY ANY ONE OF THE ASSERTED CLAIMS; CORRECT?

A. THAT'S CORRECT.

Q. I MEAN, IT'S GOT A DOUBLE RING BASE; RIGHT?

A. DOUBLE RING, CORRECT.

Q. ALL RIGHT. THE CLAIMS ARE ALL ABOUT SINGLE RING; RIGHT?

A. THAT'S CORRECT.

Q. AND THERE'S NO FLUORO AT THE R2 POSITION OR R3 POSITION; RIGHT?

A. NO, THERE ISN'T.

Q. THE CLAIMS WANT THAT, TOO, DON'T THEY?

A. THAT'S RIGHT.

Q. BUT THERE IS ONE THING THAT I WANT TO POINT OUT.

IF WE COULD, MR. ANG, SOMEHOW SLIDE THAT STRUCTURE OVER AND PUT UP THE STRUCTURE THAT WE DID TALK ABOUT THAT L-393942.

PUT THEM NEXT TO EACH OTHER. OKAY. GREAT.

SO I WANT TO MAKE SURE THAT I UNDERSTAND THIS. THE ONE ON THE RIGHT HERE --

THAT ONE, MERCK IS SAYING THAT'S NOT ACTIVE; RIGHT?

A. THAT'S CORRECT.

Q. AND THIS ONE, MK-0608, THEY'RE SAYING THAT ONE IS ACTIVE; RIGHT (INDICATING)?

A. YES.

Q. OKAY. I'M NOT A CHEMIST OR A SCIENTIST OR VIROLOGIST, BUT I'M LOOKING AT THE PICTURES. THERE'S ONLY ONE DIFFERENCE BETWEEN THOSE TWO PICTURES; RIGHT?

A. YEP.

Q. AND THIS THING HERE IS AN F AND THIS THING HERE IS AN HO; RIGHT (INDICATING)?

A. THAT'S CORRECT.

Q. AND SO BY JUST SWITCHING THIS HO WITH AN F, I WENT FROM AN ACTIVE COMPOUND TO AN INACTIVE COMPOUND; RIGHT?

A. THAT'S CORRECT.

Q. AND BECAUSE LITTLE CHANGES LIKE THAT MAKE BIG DIFFERENCES IN ORDER TO KNOW SOMETHING IS USEFUL, YOU NEED WHAT?

A. YOU NEED DATA.

Q. THANK YOU.

THE COURT: ANYTHING ELSE, MR. FISHER?

MR. FISHER: JUST A COUPLE OF QUESTIONS.

RECROSS-EXAMINATION

BY MR. FISHER:

Q. DR. SEEGER, ARE YOU AWARE THAT MERCK TESTED 2,000 NUCLEOSIDES AS OF JANUARY 2002?

A. I HAVEN'T SEEN THE DATA.

Q. OKAY. WAS IT MADE AVAILABLE TO YOU IN THIS CASE; SIR?

A. IN THIS CASE, NO. I'M NOT SURE.

Q. OKAY. YOU WEREN'T AWARE OF THAT?

A. I'M NOT SURE.

Q. AND JUST TO BE VERY CLEAR, YOU DO NOT BELIEVE THAT STRUCTURE ACTIVITY RELATIONSHIPS APPLY IN THE NUCLEOSIDE SPACE; IS THAT WHAT YOU'RE SAYING?

A. MY STATEMENT THERE IS THAT I'M NOT A CHEMIST. I'M A BIOLOGIST AND VIROLOGIST. AND I KNOW THAT IN ORDER TO FIGURE OUT WHETHER A COMPOUND, HOWEVER CLOSE IT IS TO THE NEXT COMPOUND, HAS TO BE TESTED AND THAT THERE IS UNPREDICTABILITY IN TERMS OF THE CRITERIA THAT WE HAVE DISCUSSED TODAY.

Q. SO IT DOESN'T MATTER HOW MANY ACTIVE COMPOUNDS YOU HAVE, FOR THAT NEXT COMPOUND, YOU CAN'T CLAIM IT UNLESS IT'S BEEN TESTED?

A. YOU DON'T -- YOU NEED TO TEST THE COMPOUND TO KNOW WHETHER IT HAS ACTIVITY. THAT'S MY STATEMENT.

Q. AND YOUR UNDERSTANDING IS THAT YOU CAN'T CLAIM IT UNLESS YOU'VE TESTED IT?

A. TO CLAIM, YOU NEED SOME DATA.

Q. OKAY. YOU HAVE TO HAVE TESTED IT?
A. YOU NEED SOME DATA.
Q. ON THAT COMPOUND?
A. THAT'S WHAT I'M SAYING IS THAT YOU NEED SOME DATA.
Q. ON THAT COMPOUND, THE ONE THAT IS CLAIMED?
A. IT DEPENDS NOW ON THE SITUATION, BUT YOU NEED SOME DATA.
Q. OKAY.
NO FURTHER QUESTIONS.
THE COURT: MR. FARRELL, ANYTHING ELSE FOR THIS WITNESS?
MR. FARRELL: NOTHING FURTHER, YOUR HONOR.
THE COURT: AND MAY DR. SEEGER BE EXCUSED?
MR. FARRELL: YES, YOUR HONOR.
THE COURT: DR. SEEGER, THANK YOU FOR YOUR TESTIMONY AND YOU'RE FREE TO GO.
MS. BROOKS, YOUR NEXT WITNESS.
MS. BROOKS: OUR NEXT WITNESS, YOUR HONOR, IS DR. VALENTINO STELLA, AN EXPERT IN PRODRUGS.
AND MR. SINGER WILL BE DOING THAT EXAMINATION.
THE COURT: ALL RIGHT. MR. SINGER.
DR. STELLA, IF YOU COULD COME FORWARD TO THE WITNESS STAND AND STAND TO BE SWORN.
THE CLERK: RAISE YOUR RIGHT HAND.
(PLAINTIFF'S WITNESS, VALENTINO STELLA, WAS SWORN.)
THE WITNESS: YES.

THE CLERK: THANKS. PLEASE BE SEATED.

THE WITNESS: THANK YOU.

THE CLERK: AND IF IT YOU WOULD STATE YOUR NAME AND SPELL YOUR LAST NAME FOR THE RECORD.

THE WITNESS: MY NAME IS VALENTINO, V-A-L-E-N-T-I-N-O, AND THE LAST NAME IS STELLA, S-T-E-L-L-A.

MR. SINGER: PERMISSION TO APPROACH, YOUR HONOR?

THE COURT: YES.

MR. SINGER: AND MADAM COURT REPORTER, THERE IS A COPY OF THE C.V. IN THE BINDER.

DIRECT EXAMINATION

BY MR. SINGER:

Q. OKAY. GOOD AFTERNOON, DR. STELLA. WE HAVE THE ENVIABLE 4:40 SLOT.

FIRST THINGS FIRST. IS YOUR CELL PHONE IN THE AIRPLANE MODE?

A. IT IS. I WILL CHECK, PLEASE.

Q. I WILL TALK LOUD AND SLOW. I'M NOT AS FUNNY AS MR. FARRELL, BUT WE HAVE 20 MINUTES AND I THINK I CAN INTRODUCE YOU TO THE JURY IN THAT TIME, AND WHY DON'T WE PICK UP THE SUBSTANTIVE TESTIMONY TOMORROW.

A. OKAY.

Q. OKAY. FIRST THINGS FIRST DR. STELLA. WHERE ARE YOU CURRENTLY EMPLOYED?

A. I'M A UNIVERSITY DISTINGUISHED PROFESSOR AT THE UNIVERSITY

OF KANSAS IN LAWRENCE, KANSAS.

Q. AND WHAT ARE YOU A PROFESSOR OF IN KANSAS?

A. IN PHARMACEUTICAL CHEMISTRY.

Q. AND WHAT AREAS DO YOU TEACH IN AT THE UNIVERSITY?

A. I TEACH IN THREE AREAS.

ONE IS AN AREA CALLED A PHARMACOKINETICS, AND PHARMACOKINETICS IS THE STUDY OF THE TIME PROFILE OF DRUGS IN THE BODY, HOW THEY'RE ABSORBED AND HOW THEY'RE ELIMINATED.

AND THE SECOND AREA I TEACH IN IS AN AREA CALLED PHARMACEUTICAL EQUILIBRIA, AND IN NONTECHNICAL TERMS THAT'S WHERE WE STUDY HOW THE PROPERTIES OF DRUGS AFFECT THEIR ABILITY TO BE FORMULATED AND DELIVERED, AND SPECIFICALLY I GIVE ABOUT HALF A COURSE ON AN AREA CALLED SOLUBILITY AND HOW SOLUBILITY AFFECTS THE PERFORMANCE OF THE DRUG.

AND THE THIRD AREA, I'M IN THE MIDDLE OF IT RIGHT NOW, I COULDN'T BE HERE ON MONDAY BECAUSE I'M TEACHING MY CLASS AN AREA CALLED DRUG STABILITY, AND IT HAS TO DO WITH HOW DRUGS ARE STABLE OR UNSTABLE AND HOW YOU CAN STABILIZE THEM AND HOW YOU CAN FORMULATE THEM AND HOW YOU CAN DELIVER THEM.

Q. ARE PRODRUGS SPRINKLED THROUGHOUT THE COURSES THAT YOU TEACH AT KANSAS?

A. YEAH. ALL THREE OF THOSE CLASSES WE BRING IN -- WE DON'T HAVE A SPECIFIC CLASS ON PRODRUGS, BUT PRODRUGS ARE BROUGHT IN THROUGH OUT THE CONCEPT THAT IS PART OF THAT CLASS.

Q. AND --

A. ALL THREE OF THOSE CLASSES.
Q. OKAY. AND IF YOU COULD TELL THE JURY HOW LONG YOU'VE ACTUALLY BEEN AT THE UNIVERSITY?
A. TOO LONG. NO. I'VE BEEN THERE FOR 43 YEARS IF YOU DON'T COUNT MY THREE YEARS AS A GRADUATE STUDENT THERE. SO ACTUALLY I'VE BEEN AT THE UNIVERSITY OF KANSAS A TOTAL OF 46 YEARS.
Q. OKAY. NOW, OTHER THAN PROFESSOR THAT YOU CURRENTLY TALKED ABOUT, DO YOU HAVE OTHER POSITIONS AT THE UNIVERSITY OR HAVE YOU HAD OTHER POSITIONS AT THE UNIVERSITY?
A. I'VE HAD TWO OTHER MAJOR POSITIONS AT THE UNIVERSITY. FOR ABOUT TEN YEARS, FROM ABOUT 1989, '88, UNTIL AROUND 1999 I WAS THE DIRECTOR OF THE CENTER FOR DRUG DELIVERY RESEARCH. IT WAS A STATE FUNDED INITIATIVE TO TRY TO TAKE DRUGS FROM, QUOTE-UNQUOTE, THE LABORATORY TO THE BEDSIDE.

AND DURING THAT TIME WE SPUN OUT THREE DRUG COMPANIES, THREE SMALL BIOTECH COMPANIES AND DEVELOPED A NUMBER OF PRODUCTS THAT ARE NOW ON THE MARKET.

THE SECOND AREA THAT I WAS ASSOCIATED WITH IS I WAS THE DIRECTOR OF THE DRUG DEVELOPMENT AND EXPERIMENT THERAPEUTICS GROUP AT THE NATIONAL -- AT THE K.U., UNIVERSITY OF KANSAS, CANCER CENTER, AND THAT'S WHERE WE WERE GOING FOR NATIONAL CANCER CENTER DESIGNATION WHICH FORTUNATELY WE GOT, AND I'D LIKE TO TAKE SOME CREDIT FOR THAT.

SO I -- I HEAD UP ONE OF THE FOUR GROUPS WITHIN THE CANCER CENTER PROGRAM AT THE UNIVERSITY OF KANSAS.

Q. OKAY. VERY WELL. NOW, YOU HAVE AN ACCENT. YOU'RE FROM AUSTRALIA ORIGINALLY; CORRECT?

A. YEAH, BUT AUSTRALIA, ITALY, UNITED STATES. I'M A CITIZEN OF THE PLANET EARTH.

Q. OKAY. WHEN DID YOU COME TO THE UNITED STATES?

A. I CAME AS A GRADUATE STUDENT IN 1968 TO STUDY AT THE UNIVERSITY OF KANSAS WITH PROFESSOR TAKERU HIGUCHI.

Q. AND WHY DID YOU WANT TO STUDY WITH PROFESSOR HIGUCHI?

A. HE'S THE PRIMO TOP DOG, WHATEVER YOU WANT TO CALL IT. HE'S PROBABLY THE MOST FAMOUS PERSON IN OUR FIELD, AND I HAD THE HONOR THAT HE ACCEPTED ME AS A GRADUATE STUDENT. AND I JOINED PROFESSOR HIGUCHI AS A GRADUATE STUDENT IN 1968 AND GRADUATED IN 1971.

Q. DID YOU DO YOUR UNDERGRADUATE IN AUSTRALIA?

A. YES, I DID MY UNDERGRADUATE IN AUSTRALIA. I HAVE A BACHELOR OF PHARMACY DEGREE AND I WORKED AS A HOSPITAL PHARMACIST FOR ONE YEAR BEFORE I CAME TO GRADUATE SCHOOL.

Q. VERY WELL. OVER THE COURSE OF THESE 45 YEARS, HAS YOUR CAREER -- IN ADDITION TO TEACHING PRODRUGS, HAS YOUR CAREER INVOLVED PRODRUGS FOR THOSE 43 YEARS?

A. YES. MY PH.D. DISSERTATION WAS ACTUALLY ON PRODRUGS.

Q. AND WHAT WAS THAT ABOUT?

A. SO SOME OF YOU MAY KNOW THE DRUG DILANTIN. IT'S USED TO TREAT GRAND MAL SEIZURES AND THEY'RE SPASTIC SEIZURES THAT YOU SEE ILLUSTRATED ON SOME OF THE EMERGENCY ROOM MOVIES.

AND MY GOAL WAS TO DEVELOP THE DILANTIN INJECTABLE DRUG IS GIVEN IN A FORM THAT IS PRETTY DANGEROUS. IF YOU INJECT IT TOO QUICKLY, YOU CAN KILL A PATIENT. IT ESSENTIALLY RESULTS IN A LUNG EMBOLISM IF IT'S INJECTED TOO QUICKLY.

AND MY GOAL WAS TO DEVELOP A PRODRUG OF DILANTIN THAT COULD BE GIVEN INTRAVENOUSLY AND BE MUCH SAFER THAN THE NORMAL DILANTIN PRODUCT.

ACTUALLY, FOR MY PH.D. DISSERTATION, WE ACTUALLY FILED PATENTS.

Q. OKAY. YOU JUST MENTIONED PATENTS. HOW MANY PATENTS DO YOU HAVE?

A. IT'S SOMEWHERE NORTH OF 40.

Q. OKAY.

A. YEAH.

Q. NOW, YOU TALKED ABOUT BRINGING THINGS FROM THE LAB TO THE BEDSIDE. HAVE YOU ACTUALLY -- HAVE YOU ACTUALLY DONE THAT IN YOUR CAREER?

A. YEAH. I'M THE COINVENTOR OF FOUR DRUGS THAT ARE ON THE MARKET.

Q. ARE SOME OF THEM PRODRUGS?

A. ACTUALLY ALL FOUR OF THEM HAVE ELEMENTS OF PRODRUGS.

Q. WHY DON'T YOU DESCRIBE THOSE FOR THE JURY?

A. YES. THE DRUG THAT I DEVELOPED IN MY PH.D. WORK, THAT ENDED UP BEING VERY GOOD, EXCEPT WHEN IT WAS TESTED IN ANIMALS, IT ENDED UP HAVING SIGNIFICANT SERIOUS CARDIAC SIDE EFFECTS,

AND SO THAT PARTICULAR PRODRUG THAT CAME OUT OF MY PH.D. DISSERTATION HAD TO BE SCRAPPED BECAUSE OF TOXICITY, AN UNPREDICTABLE ASPECT OF A DEVELOPMENT OF ANY DRUG, AND ALSO PRODRUGS.

BUT SUBSEQUENT TO THAT I PERSEVERED, AND THE FIRST DRUG THAT I DEVELOPED THAT WENT ON THE MARKET IS A DRUG CALLED FOSPHENYTOIN. IT WAS UNDER THE TRADE NAME OF CEREBYX. IT IS ACTUALLY A SAFE INJECTABLE FORM OF DILANTIN, THE DRUG THAT I ACTUALLY STUDIED FROM '68 TO '71.

AND THEN IN THE LATE '70S I ACTUALLY FIGURED OUT HOW TO DO IT. IT TOOK ME TEN YEARS. I'M QUICK, BUT NOT THAT QUICK. SO TEN YEARS IT TOOK ME TO COME UP WITH THAT.

THAT DRUG, FOSPHENYTOIN IS NOW THE DRUG OF CHOICE USED TO TREAT GRAND MAL SEIZURES IN HOSPITALS, EMERGENCY ROOMS AND ET CETERA. IT'S A PRETTY AMAZING DRUG AND I WAS PRETTY PROUD TO DEVELOP THAT.

BUT CAN I GIVE A LITTLE ANECDOTE STORY ON THAT?

Q. SURE. I'M SURE IT WOULD BE HELPFUL FOR THE JURY TO UNDERSTAND.

A. THE FIRST 100 GRAMS OF THE DRUG THAT WE MADE WAS MADE BY A YOUNG UNDERGRADUATE PHARMACY STUDENT AT THE TIME, ROB MEYERS. ROB MADE THE FIRST 100 GRAMS. WE GAVE IT TO THE COMPANY THAT HAD LICENSED THE DRUG FOR TESTING.

25 YEARS LATER, ABOUT THREE YEARS AGO, I GOT AN E-MAIL FROM ROB. HE HAD -- ROB HAD MARRIED AND HAD A YOUNG FAMILY AND

I GOT AN E-MAIL AND HE SAID, MY DAUGHTER JUST FELL OFF A HIGH WALL. HE LIVES IN IDAHO. SHE FELL OFF A HIGH WALL AND HAD A SEVERE CONCUSSION AND WAS RUSHED TO THE EMERGENCY ROOM. SHE WAS GOING TO BE OKAY, BUT THE DOCTOR SAID, WE BETTER GIVE HER AN ANTI-CONVULSANT DRUG TO STOP THE CHANCE OF ANY SEIZURES.

SHE GOT THE DRUG THAT HE DEVELOPED 25 YEARS EARLIER. IT WAS AMAZING.

AND I GOT THIS E-MAIL AND IT WAS LIKE THE AH-HA MOMENT, THIS IS WHAT WE DO.

SO THAT WAS ONE OF THE DRUGS. I CAN GIVE YOU A COUPLE STORIES ON THAT, BUT WE DON'T HAVE THAT MUCH TIME.

Q. WE CAN BE HERE ALL DAY, DR. STELLA.

A. VIRTUALLY.

Q. AND JUST TO BE CLEAR FOR THE JURY. IS THIS FOSPHENYTOIN, IS THAT A PRODRUG?

A. IT IS A PRODRUG.

Q. OKAY. ARE THERE A COUPLE OF OTHER -- IN OUR LITTLE TIME LEFT, ARE THERE A COUPLE OF OTHER PRODRUGS THAT YOU'VE DEVELOPED FROM THE LAB TO THE MARKET?

A. YES. ONE OF THEM IS THE DRUG THAT I THINK IS BEING MENTIONED HERE TENOFOVIR DISOPROXIL, OKAY, WHICH IS THE VIREAD DRUG, V-I-R-E-A-D, FROM GILEAD.

SOME OF YOU MAY HAVE HEARD OF ONE TABLET ONCE A DAY THAT TREATS AIDS. THE MAJOR INGREDIENT IS VIREAD, AND I'M THE INVESTOR OF THAT AND I DID THAT IN MY CAPACITY AS A CONSULTANT

WITH GILEAD.

Q. AND WAS THERE ONE OTHER DRUG YOU WANTED TO TALK ABOUT?

A. THERE'S TWO OTHERS.

Q. TWO OF THEM. GO RIGHT AHEAD.

A. OKAY. AND THE THIRD ONE IS A DRUG CALLED FOSPROPOFOL, F-O-S-P-R-O-F-O-L, SOMETHING LIKE THAT. I'LL GIVE IT TO YOU LATER.

YOU MAY KNOW THE DRUG AS PROPOFOL, AND IT'S ALSO CALLED DIPRIVAN, D-I-P-R-I-V-A-N. THAT'S THE DRUG THAT KILLED MICHAEL JACKSON. OKAY. THE DRUG THAT KILLED MICHAEL JACKSON IS AN ANESTHETIC DRUG, SO IT'S A CLEAR MILKY SOLUTION DRUG AND THE IT'S NOT CAPABLE OF BEING GIVEN AS A CLEAR SOLUTION. IT LOOKS LIKE MILK.

IF YOU GO IN TO HAVE KNEE SURGERY OR SOMETHING LIKE THAT, YOU'RE GOING TO GET DIPRIVAN.

WE CAME UP WITH A -- DIPRIVAN HAS A NUMBER OF PROBLEMS. THE LIPID -- IT'S ALSO -- IF YOU HAD A CAR INJURY, HEAD TRAUMA AND YOU'RE PUT INTO AN ARTIFICIAL COMA, THIS IS THE DRUG THAT THEY WOULD USE. OKAY?

AND WHAT WE DID WAS THAT WE WERE ACTUALLY ABLE TO TAKE THIS VERY INSOLUABLE AND VERY PAINFUL DRUG ON INJECTION AND IT CREATES MASSIVE BRACHIAL PAIN IN THE ARM, AND WE CAME UP WITH A SAFE INJECTABLE FORM OF THAT CALLED FOSPROPOFOL, AND THAT CAUSES NO PAIN ON INJECTION AND YOU DON'T GET THE LIPIDS AND IT WORKS REALLY GOOD AND IT WAS APPROVED A NUMBER OF YEARS AGO.

AND IT IS NOW OFF THE MARKET. IT WASN'T MAKING A DENT FROM A COMMERCIAL POINT OF VIEW, AND IT'S A PRODRUG AS WELL.

Q. AND ONE MORE.

A. THERE'S A WONDERFUL DRUGS CALLED VELCADE, V-E-L-C-A-D-E. THAT'S NOT NAMED AFTER ME.

AND THE DRUG IS TO TREAT MULTIPLE MYELOMA AND IT WAS THE EFFECTIVE DRUG TO TREAT MULTIPLE MYELOMA.

AT THE TIME I HAD A CONTRACT WITH THE NATIONAL CANCER INSTITUTE TO DEVELOP AND FORMULATE PROBLEMATIC DRUGS, AND WE WERE ASKED TO FORMULATE THE ACTIVE INGREDIENT IN VELCADE. IT'S A DRUG CALLED BORTEZOMIB, AND I'LL GIVE YOU THE SPELLING LATER, BORTEZOMIB.

AND WE ACTUALLY CAME UP WITH A REALLY NICE FREEZE DRIED STABLE PRODUCT. WE FREEZE DRIED THE PRODUCT WITH A SUGAR CALLED MANNITOL, AND TO OUR SURPRISE, WHAT HAPPENED IS WHEN YOU PRODUCE THIS DRUG WITH MANNITOL, YOU ACTUALLY FORM PRODRUGS IN THE FORMULATION. THIS IS ACTUALLY A SECOND EXAMPLE OF THAT.

SO VELCADE IS TECHNICALLY NOT A PRODRUG, BUT ACTUALLY THE MANNITOL ESTER THAT IS FORMED IN THAT FORMULATION COULD BE CONSIDERED A PRODRUG.

Q. OKAY. NOW, JUST GENERALLY SPEAKING, DR. STELLA, WERE THESE PRODRUGS, WERE THEY EASY TO DEVELOP OR WERE THEY HARD TO DEVELOP?

A. WELL, I GAVE YOU THE EXAMPLE OF THE DILANTIN. IT TOOK ME TEN YEARS TO FIGURE IT OUT.

Q. OKAY.
A. BUT ANY PRODRUG DEVELOPMENT IS AN ONEROUS TASK REQUIRING LOTS OF TESTING AND LOTS OF TRIAL AND ERROR AND VERY UNPREDICTABLE.
Q. AND JUST TO TALK A BIT ABOUT YOUR PUBLICATIONS, ABOUT HOW MANY PEER REVIEWED PUBLICATIONS HAVE YOU BEEN FORTUNATE TO BE A PART OF OVER THE COURSE OF YOUR CAREER?
A. OH, IT'S IN THE RANGE OF AROUND 300 OR SO.
Q. AND ABOUT HOW MANY OF THOSE RELATE TO PRODRUGS?
A. PROBABLY ABOUT A THIRD OF MY PAPERS ARE ON PRODRUGS.
Q. HAVE YOU WRITTEN BOOKS ON PRODRUGS?
A. YEAH. WE WROTE THE FIRST WHAT I WOULD SAY DEFINITIVE BOOK ON PRODRUGS, IT HAD PRODRUGS IN THE TITLE. WE PUBLISHED THAT IN 1975. THAT'S A YEAR I DON'T REMEMBER TOO FONDLY BECAUSE DOING THAT, AND I WAS UP FOR TENURE AND EVERYTHING ELSE, AND IT WAS A STRESSFUL YEAR FOR ME. BUT WE CAME OUT WITH THAT BOOK IN 1975.

AFTER THAT I'VE WRITTEN BOOK CHAPTERS AND REVIEW ARTICLES.

BUT IN 2007, AT THE SUGGESTION OF ONE OF MY COLLEAGUES, WE PUT TOGETHER A 56 CHAPTER BOOK ON PRODRUGS. IT ACTUALLY WAS BOUND IN TWO VOLUMES BECAUSE THEY COULDN'T PRINT IT IN ONE VOLUME IT WAS SO THICK.

IT'S SORT OF, IF YOU LIKE TO THINK OF IT AS THE BIBLE OR THE DICTIONARY OF PRODRUGS. I WAS THE LEAD EDITOR ON THAT. I DID NOT WRITE ALL 56 CHAPTERS. I WROTE, I THINK, EIGHT OF THE

CHAPTERS. AND I HAD A COUPLE OF OTHER COLLEAGUES THAT WERE COEDITORS, BUT I WAS THE LEAD EDITOR ON THAT BOOK.

Q. ARE THERE ANY AWARDS THAT YOU HAVE WON OVER YOUR CAREER THAT YOU'RE PARTICULARLY PROUD OF THAT YOU WOULD LIKE TO TELL THE LADIES AND GENTLEMEN OF THE JURY ABOUT?

A. THERE ARE A COUPLE OF THEM.

THE TWO MAJOR ORGANIZATIONS IN OUR FIELD ARE THE AMERICAN PHARMACISTS ASSOCIATION, APHA, AND THEIR TOP RESEARCH AWARD IS CALLED THE HIGUCHI PRIZE AND I GOT THAT A FEW YEARS AGO. IT WAS NAMED AFTER MY ADVISOR, SO IT WAS PARTICULARLY EMOTIONAL FOR ME WHEN I RECEIVED THAT.

AND WE ALSO HAVE AN ANOTHER ORGANIZATION CALLED AAPS, AMERICAN ASSOCIATION OF PHARMACEUTICAL SCIENTISTS, AND I'VE RECEIVED THE TOP RESEARCH AWARD FROM THEM.

TWO OTHER AWARDS I'M VERY PROUD OF. ON APRIL 15TH, HERE COMING UP IN ABOUT A MONTH, I'M GOING TO BE INAUGURATED -- I'M GOING TO BECOME A FELLOW OF THE NATIONAL ACADEMY OF INVENTORS.

AND THEN ANOTHER ONE I'M REALLY PROUD OF IS THE UNIVERSITY OF KANSAS GIVES OUT, I THINK, A THING CALLED THE HOPE AWARD, WHICH IS THE TOP TEACHING AWARD AT THE UNIVERSITY, AND IT'S ACTUALLY VOTED ON BY THE GRADUATING SENIOR CLASS OF THE WHOLE UNIVERSITY AND I'M RECEIVING THE HOPE AWARD.

Q. TWO MORE QUESTIONS ON YOUR QUALIFICATIONS. HAVE YOU WORKED, DR. STELLA, IN YOUR CAPACITY AT KANSAS, AS A CONSULTANT FOR PHARMACEUTICAL COMPANIES?

A. YES. I'VE CONSULTED FOR NORTH OF 120 PHARMACEUTICAL COMPANIES OVER MY PROFESSIONAL CAREER, INCLUDING BOTH PARTIES IN THIS SUIT.

SO I'VE DONE RECRUIT -- I'VE DONE CONSULTING FOR BOTH MERCK, AS WELL AS FOR GILEAD.

Q. OKAY. AND I TAKE IT THAT CONSULTING WORK, HAS IT INVOLVED PRODRUGS?

A. I WOULD SAY IN THE CASE OF BOTH OF THE COMPANIES IT INVOLVED AT LEAST A SIGNIFICANT FRACTION, PROBABLY MOST OF THE TIME HAD TO DO WITH SOME ELEMENTS OF PRODRUGS.

Q. ALL RIGHT. DR. STELLA, DO YOU BELIEVE, BASED ON YOUR PRODRUG AND DRUG DISCOVERY RESEARCH AND EXPERIENCE, THAT YOU'RE QUALIFIED TO RENDER EXPERT OPINIONS IN THIS CASE REGARDING THE INVALIDITY OF THE '499 PATENT?

A. I BELIEVE I'M QUALIFIED.

MR. SINGER: YOUR HONOR, I WOULD TENDER DR. STELLA AS AN EXPERT TO THIS JURY IN DRUG DELIVERY AND DRUG DEVELOPMENT, INCLUDING THE USE OF PRODRUGS.

THE COURT: WOULD YOU LIKE --

MR. RABINOWITZ: NO OBJECTION, YOUR HONOR.

THE COURT: ALL RIGHT. DR. STELLA MAY SO TESTIFY.

MR. SINGER: YOUR HONOR, THIS IS A PERFECT BREAKING POINT IF WE WANT TO STOP. WE'RE AT 5 TO 5:00.

THE COURT: I THINK EVERYONE WOULD LIKE TO GO HOME.

ALL RIGHT. LADIES AND GENTLEMEN, TOMORROW WE ARE STARTING

AT 9:00 O'CLOCK. WE WILL FINISH RIGHT AROUND NOON THOUGH. SO IT WILL BE A SHORTER DAY.

LEAVE THOSE NOTEBOOKS AND BADGES ON YOUR CHAIRS AND HAVE A GOOD EVENING. AND AS I ALWAYS SAY AT THE END OF THE EVENING, PLEASE REMEMBER NOT TO DISCUSS THE CASE WITH ANYONE AND DON'T DO ANY RESEARCH OR INVESTIGATION ABOUT ANYTHING.

HAVE A GOOD EVENING.

DR. STELLA, YOU'RE WELCOME TO GO BACK TO YOUR SEAT.

(JURY OUT AT 4:55 P.M.)

THE COURT: ALL RIGHT. PLEASE BE SEATED EVERYONE.

ANY HOUSEKEEPING ITEMS THIS EVENING?

MS. BROOKS: NOTHING ON BEHALF OF GILEAD, YOUR HONOR.

THE COURT: THANK YOU.

MR. GENDERSON: AND NOTHING ON BEHALF OF MERCK.

THE COURT: ALL RIGHT. I'LL LOOK FORWARD TO SEEING IF I HAVE ANY E-MAILS. TOMORROW I AM AVAILABLE AT 8:30. DO YOU THINK IT'S NECESSARY -- I MEAN, I'LL BE HERE, BUT IS IT GOING TO BE NECESSARY?

MS. BROOKS: I'VE BEEN TOLD WE'RE NOT FILING ANYTHING AT 5:00 P.M., SO NOT ON OUR SIDE.

MR. GENDERSON: NO ISSUES ON OUR SIDE.

THE COURT: WELL, I'LL CERTAINLY CHECK MY E-MAIL AND I'M HERE, SO IF SOMETHING COMES UP JUST SEND ME AN E-MAIL SO I KNOW YOU'RE COMING.

AND WITH THAT, I'LL SEE YOU TOMORROW.

MR. GENDERSON: THANK YOU, YOUR HONOR. HAVE A GOOD EVENING.

MS. BROOKS: THANK YOU.

THE COURT: THANK YOU.

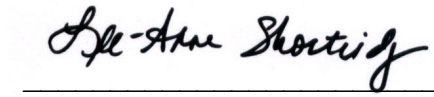
(COURT CONCLUDED AT 4:56 P.M.)

CERTIFICATE OF REPORTERS

WE, THE UNDERSIGNED OFFICIAL COURT REPORTERS OF THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF CALIFORNIA, 280 SOUTH FIRST STREET, SAN JOSE, CALIFORNIA, DO HEREBY CERTIFY:

THAT THE FOREGOING TRANSCRIPT, CERTIFICATE INCLUSIVE, IS A CORRECT TRANSCRIPT FROM THE RECORD OF PROCEEDINGS IN THE ABOVE-ENTITLED MATTER.

IRENE RODRIGUEZ, CSR, CRR
CERTIFICATE NUMBER 8076



LEE-ANNE SHORTRIDGE, CSR, CRR
CERTIFICATE NUMBER 9595

DATED: MARCH 9, 2016